National Library
of Canada

Canadian Theses Service

Ottawa, Canada
K1A 0N4

Bibliothèque nationale
du Canada

Services des thèses canadiennes

CANADIAN THESES

THÈSES CANADIENNES

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED

LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE

NL-339 (r.86/06)

Canada

THE UNIVERSITY OF ALBERTA

# AN INVESTIGATION OF THE SALIENCE IMBALANCE THEORY OF METAPHOR PROCESSING IN CHILDREN'S READING COMPREHENSION

by

© ZOLTAN MATE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA
SPRING, 1987

Permission has been granted to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film.

The author (copyright owner) has reserved other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without his/her written permission.

L'autorisation a été accordée à la Bibliothèque nationale du Canada de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur (titulaire du droit d'auteur) se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation écrite.

ISBN 0-315-37635-X

THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: Zoltan Mate

TITLE OF THESIS: An Investigation of the Salience Imbalance Theory of Metaphor Processing in Children's Reading Comprehension

DEGREE: Ph.D.

YEAR THIS DEGREE GRANTED: 1987

Permission is hereby granted to THE [illegible]ERSITY OF ALBERTA LIBRARY to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

Z. Mat
..............................

Apt 1905-2, Michener Park,
Edmonton, Alberta
T6H 5B5

Date: April 16, 1987

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "An Investigation of the Salience Imbalance Theory of Metaphor Processing in Children's Reading Comprehension," submitted by Zoltan Mate in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Grace Malicky
Supervisor

John E. Oster

Joyce Edwards

External Examiner

Date: April 16, 1987

# ABSTRACT

The main purpose of this study was to investigate and test the validity of selected predictions of the Salience Imbalance model of metaphor processing for understanding how children comprehend metaphors when they read. The secondary focus of the research was to expand empirical knowledge about children's reading comprehension and processing of metaphors. Central to the examination was children's comprehension of nonliteral similarity statements in which the terms of the metaphor were reversed. The level of perceived salience of the shared attributes for the terms of the metaphors and its effect on children's comprehension was also studied. In addition, the study investigated how children's metaphorical comprehension is influenced by a list of defining and characteristic attributes for the topic and the vehicle.

Ninety grade six students divided into three groups participated in the study. The subjects in Group 1 paraphrased six metaphors and evaluated their "goodness" on a five point scale. The subjects in Group 2 paraphrased the same six metaphors and selected salient attributes for the topic and the vehicle from a list of attributes. In the third group, the subjects paraphrased the same metaphors and evaluated the perceived salience level of shared attributes for the terms of the metaphors.The responses were analyzed by t-test, analysis of variance, correlation and Chi-square statistics. The findings supported the prediction of the salience imbalance model that metaphor comprehension and the measure of salience of the shared attribute are affected by the order of terms in the metaphor. The subjects used a variety of strategies to obtain meaning for metaphorical statements. It was also found that the availability of semantic features and shared attributes enhance significantly metaphor comprehension. The study is concluded with recommendations for further research.

# Acknowledgement

Considering the relative complexity of metaphor comprehension, I was very fortunate and privileged to have the opportunity to work with Professor G. Malicky during all the stages of this research.

Without her comprehensive knowledge, her insights and her astuteness in confronting tenacious problems, my task would have been a much more difficult one. I am deeply indepted to her for her genuine interest in the topic as well as for her commitment in providing me with systematic academic advise regardless of the hour in the day, weekend, or season.

Also, I would like to express my gratitude towards Professors J. Edwards, D. Richards, J. Oster, W. Wilde, and L. Tuinman for their valuable assistance in selected aspects of the study and for their help in clarifying pertinent issues of significance. In the area of theory and models of educational research, Professor W. Fagan's help proved to be crucial and indispensable.

I also feel indebted towards the Division of Educational Research Services, and particular to Dr. D. Harley and Hau Chow, who provided excellent service in running the data on the computer and giving me advise on its output.

Also, I would like to express my gratitude towards Mr. N. Gourley, G. Knowles, D. McFarlane, and A. Robinson, Principals of Edmonton Public School System who provided me with help in the data collecting process and related tasks.

# TABLE OF CONTENTS

CHAPTER PAGE

I. INTRODUCTION TO THE STUDY.................................. 1

- Purpose of the Study.................................. 4
- Definition of Terms.................................. 5
- Research Questions.................................. 8
- Research Hypotheses.................................. 9
- Significance of Study.................................. 11

II. THEORETICAL BACKGROUND AND RELATED LITERATURE.......... 13

- Historical Review of Metaphor.................. 14
  - The Concept of Metaphor.................... 14
  - Aristotle and the Classical View of Metaphor.................................. 15
  - The Middle Ages.......................... 16
  - The Elizabethan Period..................... 16
  - Ramus, Dryden, and the Puritans............ 17
  - The Eighteenth Century..................... 19
  - The Romantic View.......................... 19
  - Some Twentieth Century Views............... 21
  - Philosophy and Rhetoric.................... 23
  - Linguistics and Metaphors.................. 26
  - Anthropology............................... 29

CHAPTER PAGE

The Psycholinguistic Era.................. 29

Theories of Metaphor........................ 32

The Substitution Theory.................... 32

The Object Comparison Theory and its Criticism............................ 33

The Interactions Theory.................... 36

The Transformation View.................... 39

The Semantic Feature Models................ 42

Theoretical Issues and the Functioning of Metaphor.................................... 52

Similarity Statements and Metaphorical Comprehension............................... 52

The General Process of Metaphoric Comprehension........................... 52

Similarity and the Similarity Statement..... 57

Classification of Similarity Statements..... 59

The Relationship between Similes and Metaphorical Statements.................... 65

Description of Basic Concepts of Metaphoricity...... 65

Attributes................................. 65

The Concept of Features.................... 65

Attributes as Subschemata.................. 68

Feature Matching........................... 69

CHAPTER PAGE

Attribute Inequality........................ 70

Topic-Vehicle Relations..................... 71

Salience.................................... 74

The Concept and Defintion of Salience....... 74

The Measure of Salience..................... 76

Factors Determining Salience................ 81

Metaphoricity and its Sources............... 83

Salience Imbalance.......................... 85

Symmetry of Similarity Relations............ 85

Asymmetry and the Focusing Hypothesis....... 87

Directionality and its Influencing Factors.. 90

Other Dependent Asymmetries and the Role of Hierarchy................................ 92

The Salience Imbalance Theory (Model).............. 95

A General Description of the Model............. 96

The Comparison of the Salience Imbalance and Contrast Models................................. 98

Claims and Predictions by the Salience Imbalance Model................................. 99

Review of Recent Literature on Children's Production and Comprehension of Metaphors...................... 102

Changing Views on the Nature of Children's Metaphoric Language.............................. 102

CHAPTER PAGE

The Formal and Functional Views................. 103
Children's Metaphoric Competence................ 106
Children's Comprehension of Figurative Language.................................. 108
Limiting Factors in Children's Metaphor Comprehension............................... 113
Summary........................................ 114
III. DESIGN OF THE STUDY................................ 116
Subjects........................................ 116
Development of Instruments...................... 117
Selecting Metaphors............................. 117
Developing the Tasks............................ 119
Pilot Study..................................... 122
Administration of Instruments................... 131
Scoring the Instruments......................... 131
Analysis of Data................................ 134
Comparisons..................................... 134
Statistical Analysis............................ 137
IV. RESULTS OF THE STUDY AND DISCUSSION............ 140
Hypothesis 1.................................... 140
Hypothesis 2.................................... 151
Hypothesis 3.................................... 156
Hypothesis 4.................................... 160

CHAPTER PAGE

Hypothesis 5 .......... 167
Hypothesis 6 .......... 176
Hypothesis 7 .......... 183
Hypothesis 8 .......... 187

V. SUMMARY, CONCLUSION, AND IMPLICATIONS .......... 195
Summary .......... 195
Conclusions .......... 197
Implications of the Study .......... 200
Implications for the Theory .......... 200
Implications for Practice .......... 206
Limitations of the Study .......... 206
Recommendations for Further Research .......... 208

REFERENCES .......... 210

APPENDIX A: Edmonton Public School Board Elementary Reading Test Scores .......... 217

APPENDIX B: Instruments for Groups 1, 2, and 3 .......... 221

APPENDIX C: Data Collection Procedures .......... 246

APPENDIX D: Letter to Parents and Consent Form .......... 251

# LIST OF TABLES

TABLES PAGE

4.1 Comprehension Scores in the Ascending and the Descending Modes for Treatment Group 1.............. 142

4.2 Summary of t-test for Comprehension Scores in Treatment Group One.............................. 143

4.3 Goodness Scores in Ascending and Descending Modes for Group 1.................................. 152

4.4 Summary of t-tests of Comprehension Scores in Treatment Group Two.............................. 153

4.5 Pearson Correlation Coefficients for Comprehension and Goodness Scores in Treatment Group 1........... 158

4.6 Comprehension Scores for Each Metaphor for Group 2.. 161

4.7 Summary of Results of One-way Analysis of Variance on Comprehension Scores for Groups One, Two, and Three....................................... 162

4.8 Summary of Results of Scheffe tests for Groups One, Two, and Three................................ 163

4.9 Summarized Scores on the Selection of "Defining" Attributes for the Topic and the Vehicle in Group 2............................................ 168

TABLES PAGE

4.10 Pearson Correlation Coefficients for Comprehension and Defining Scores in Treatment Group 2........................................... 169

4.11 A Crosstabulation of Comprehension Scores by Defining Scores in the Six Metaphors................ 172

4.12 Summary of Results of Chi-square Analysis on Comprehension and Defining Scores in Group 2........ 173

4.13 Summary of Results of Chi-square Analysis on Correct Comprehension Scores and Defining Scores in Group 2........................................... 174

4.14 Scores on the Selection of Characteristic Attributes for the Topic and the Vehicle in Group 2........................................... 178

4.15 Pearson Correlation Coefficients for Comprehension and Characteristic Scores in Treatment Group 2...... 180

4.16 Summary of Results of Chi-square Analysis on Comprehension Scores and Characteristic Scores in Group 2........................................... 181

4.17 Comprehension Scores in the Ascending Mode in Group 3........................................... 184

4.18 Salience Scores on the Shared Attributes for the Topic and the Vehicle in Group 3.................... 188

4.19 Pearson Correlation Coefficients for Comprehension

TABLES PAGE

and Salience Scores of Shared Attributes in Group 3.......................................... 189

4.20 Summary of Results of Chi-square Analysis on Correct Comprehension Scores and Salience Scores on Shared Attributes in Group 3.......................... 191

# LIST OF FIGURES

FIGURES PAGE

1. An Illustration of the Common and Distinctive Features of a Metaphorical Statement.................. 77

4.1 Comprehension Scores on Metaphors in Ascending and Descending Modes for Group 1.......................... 145

# CHAPTER I

## INTRODUCTION TO THE PROBLEM

> Intermediate level readers succeed or fail to interpret simple metaphors and similes not because they can or can't cope with the abstractions of metaphor in general but rather because they do or don't associate the critical matching attribute with the vehicle in the metaphor (Baldwin, 1984, p.6).

From an educational point of view, there have been two main schools of thinking on metaphors. There are those who view it as an aesthetic, ornamental device or a heuristic aid which is not essential for a cognitive understanding of what is being taught or learned. There are others who argue that the use of metaphors is an attempt to avoid hard analytical thinking, that it encourages sloppy thought and its elimination would result in fewer mistakes.

More recently, theoretical and applied research points toward an expansion of the scope and cognitive significance of metaphors in the learning process. It is more and more evident that metaphors enable one to transfer understanding from what is well-known to what is less well-known in vivid, concrete chunks of experience.

Children's learning always starts from what they already know. But how can they learn something new by using old knowledge? The metaphor can provide this bridge between the known and given context of understanding and an unknown and changed context. It enables children, during the learning process, to pass from the more familiar to the unfamiliar by providing a suitable mechanism of comprehension. During this process, new knowledge is created which results in a change in children's "cognitive structure" (Petrie, 1980,p.442). The metaphor's function can be viewed as an instrument for guiding these cognitive changes and with its facilitation, the teacher can intentionally produce changes in the cognitive structure of the child. With a better understanding of the role and concept of the metaphor by teachers, they can be more successful in assessing students' cognitive structure along with the conceptual structure of new materials, and in using metaphors to reduce anomalies in children's thinking and ultimately improve instructional practices.

Just as there are many views on the function of metaphors, there are also many theories of metaphors and metaphor comprehension. One of the most comprehensive is Ortony's Salience Imbalance Theory (1979, 1985). His focus is on semantic attributes or features which are believed to be a representation of knowledge. During the comprehension process, Ortony hypothesizes that attributes of the two domains of metaphors are compared and those which are common to both terms as shared features are chosen. For instance, in the metaphorical sentence "The sailboat is a ballerina" the knowledge domains of the two terms (sailboat and ballerina) are represented by the following attributes: "gracefulness","slim", "gliding on water", "delicate structure", etc. for the sailboat and "graceful movements", "slender", "gliding", "attractive", etc. for the ballerina. From these attributes (features), "gracefulness" and the notion of "gliding" will be chosen by the readers as grounds because these attributes are shared by both terms. One can view both the sailboat and the ballerina as "graceful". The shared features or grounds, however, are not equal in terms of salience or importance. Ortony hypothesizes that subjects perceive grounds as more salient for the second term (vehicle) than for the first one (topic). In this example, the concept of "gracefulness" is more telling, conspicuous, distinguishable, salient, or outstanding for the ballerina than for the sailboat. And although the sailboat can be viewed as graceful, as well, this feature is not the most important (salient) attribute of the concept of the sailboat. As a result, a salience imbalance exists between features of the topic and the vehicle of metaphors. This is the crux of Ortony's salience imbalance theory, a theoretical basis for further inquiry which provides the framework for this study.

Although there is research evidence to show that it takes no longer for a child to read or paraphrase metaphors than literal statements, that metaphors are not necessarily more difficult to interpret than non-metaphors, and that metaphors are no more difficult to remember than literal statements (Harris, 1976;

Tanhauser, 1978; Harris, 1979; Harris, Lahey & Marsalek, 1980), relatively little is known about the actual mechanisms of metaphor comprehension. Few teachers with classroom experience would deny their occasional frustration over their students' lack of success in comprehending metaphors during reading. Hence, there is a need for research into how children comprehend metaphors with a view to enhancing instruction in this area.

## Purpose of the Study

The major purpose of this study involves the expansion of empirical knowledge about children's comprehension and processing of metaphors. It focuses on children's knowledge which is embedded in semantic meaning carriers, the attributes, and expands the available data on the role shared attributes play in comprehension of metaphor in reading. This knowledge "may be the key to instructional effectiveness" as Baldwin states in his 1982 (p.540) study. More specifically, this study will investigate the usefulness of the salience imbalance theory in understanding how children comprehend metaphors. Selected aspects of this theory will be used to develop specific reading comprehension tasks in order to investigate children's metaphor comprehension. These tasks will be used to gather data to test selected predictions of the salience imbalance theory involving the role that the number and salience of available attributes in children's semantic memory play in metaphor comprehension, and the role of shared attributes in children's comprehension of metaphors.

## Definition of terms

Anomalous similarity statement:

The two terms of an anomalous similarity statement are perceived as neither literally nor metaphorically similar.

Ascending mode:

The shared attribute is perceived as low salient for the topic and highly salient for the vehicle (low/high condition).

a-term:

The first lexical item of a metaphorical expression which is elaborated upon by the second term of its domain, the vehicle.

Attribute:

Same as semantic feature. The terms attribute and feature are used interchangeably in this paper.

b-term:

The second lexical item of a metaphorical expression which contains new information about the less prototypical topic.

Characteristic feature:

A representative of the not essential (incidental) aspect of a word's meaning.

Common feature:

A semantic feature which is shared by the topic and the vehicle of the metaphor.

Defining feature:

A representative of an essential aspect of the word's meaning.

Descending mode:

The shared attribute is perceived as low salient for the vehicle and highly salient for the topic (high/low condition).

Feature:

A semantic meaning representing a constituent or element (subschemata) of the schema of a concept. It can be essential (defining) or incidental (characteristic) to the meaning of a lexical item.

Figurative language:

Words are used in a nonliteral or unusual sense where the intended meaning (utterance meaning) and the literal meaning do not accord.

Ground:

An attribute which is shared by both the topic and the vehicle of the metaphor.

Interaction:

A relationship between the topic, the vehicle, and the ground of a metaphor.

Literal similarity statement:

Two objects are viewed as literally similar when their shared features (attributes) are highly salient (important) to both terms of the statement.

Metaphor:

A figure of speech containing an implied comparison of two objects in which aspects of one object are transferred to another object, so that the second object is spoken of as if it were the first.

Metaphoricity:

It is the degree to which comparison of objects is one of literal similarity versus a nonliteral comparison. Metaphoricity is represented by the relative degree of salience of matching attributes of the topic and the vehicle.

Metaphorical similarity statement:

Two objects are viewed as similar metaphorically when their shared attributes are not important to both terms of the statement but to only the second term (same as metaphor).

Salience:

Degree of the prominance and relevance of a particular attribute which is used to discriminate between the terms of a metaphor.

Salience imbalance:

A condition in which the salience level of the matching attributes for the topic and the vehicle are perceived as unequal. The matching attribute is more salient for the topic and less salient for the vehicle resulting in directionality and a degree of diagonality from the vehicle to the topic.

Schemata:

A data structure for representing knowledge about all concepts stored in long term memory.

Shared attribute:

Same as ground. These two terms are used interchangeably in this study.

Similarity:

A semantic feature matching process in which common and distinctive attributes of the topic and the vehicle are related.

Topic:

same as a-term

Vehicle:

same as b-term

## Research Questions

In order to expand empirical knowledge about the process of children's comprehension of metaphors, the following questions were posed.

1. How does the ascending and descending mode of metaphors affect children's comprehension?

2. Is children's metaphorical comprehension influenced by

the number of attributes which are available to be matched and promoted?

3. How is children's comprehension of metaphors affected by selecting defining and characteristic attributes from a list of features of the topic and the vehicle? Are there individual differences?

4. Is children's comprehension of metaphors influenced by their perception of the salience level of shared attributes for the vehicle and for the topic?

## Research Hypotheses

1. There will be a significant difference on a measure of comprehension of metaphors in the ascending and in the descending modes with higher scores on the ascending mode.

2. There will be a significant difference on a measure of salience (goodness) between metaphors in the ascending and descending mode with scores higher on the ascending mode.

3. There will be a significant positive relationship between the measure of comprehension of metaphors in a paraphrasing task and the scores of salience (goodness) of metaphors.

4. There will be a significant difference in the measure of comprehension of metaphors in a paraphrasing task when attributes are

not given and when 24 attributes are given. Children will receive higher scores for metaphor comprehension when a list of attributes is given and lower scores when the list of attributes is not given.

5. There will be a significant positive relationship between the measure of comprehension of metaphors in a paraphrasing task and scores on defining attributes selected by children from a list of 24 mixed attributes.

6. There will be a significant negative relationship between the measure of comprehension of metaphors in a paraphrasing task and scores on characteristic attributes selected by children from a list of 24 mixed attibutes.

7. There will be a significant difference in the measure of comprehension of metaphors in a paraphrasing task when subjects receive shared attibutes and when they do not receive shared attributes. Children will receive higher scores for metaphor comprehension when they receive shared attributes and will receive lower scores when they do not receive shared attributes.

8. There will be a significant positive relationship between the measure of comprehension of metaphors in a paraphrasing task and the scores on the perceived level of salience of shared attributes for the b-term and a significant negative relationship for the a-term.

## Significance of Study

The primary contribution of this study is to an increased theoretical understanding of how metaphors are comprehended in written text. The salience imbalance theory of metaphor comprehension, an advanced semantic feature model, was identified as an instrument which had the potential for providing this type of knowledge. This theory was selected because it systematically describes and explains the phenomenon of metaphor comprehension in terms of a set of interrelated concepts (borrowed from the field of semantics and psycholinguistics) and provides an integrating common framework (a guiding function) for the development of further knowledge.

The theoretical significance of this study lies with its attempt to test the predictions of this theory with sixth grade students to determine the adequacy of the theory for explaining metaphorical processing for that grade level. A truly comprehensive and universal theory needs to be applicable to a wide range of age groups. Two major hypotheses of the theory (salience imbalance and asymmetry) were investigated empirically and the collected data served as a basis for statements to accept, reject, clarify, or refine the claims of the salience imbalance theory. In particular, those predictions of the model were tested which proclaim that the reversal of terms of a metaphor and along with it the salience level of attributes will result in decreased metaphor comprehension among subjects. Furthermore, this study investigated the effect of an increase or decrease in the number of defining and characteristic attributes and the perceived salience of shared attributes of the topic and the vehicle on the general process of metaphor comprehension.

Increased knowledge of children's comprehension of metaphors as they read also has significance for clasroom teachers. This study provides new data on defining, characteristic, and shared attributes. This will help teachers understand the role these semantic entities play in children's knowledge and how the arrangement of attributes for the topic and the vehicle affects the comprehension of metaphors. In terms of regular classroom instruction, teachers will be helped to understand how subtle differences in knowledge of attributes affect reading comprehension.

It is believed that this study is significant because results of previous research were used to select independent variables affecting children's reading comprehension of metaphors, and consequently, the chances of gaining significant knowledge were increased. Furthermore, it is believed that the quality of this study is determined, not by the complexity of the design or the sophistication of the statistical methods used, but "by the depth of rationale and theoretical constructs that guide the research design" (Borg & Gall, 1983, p.573).

# CHAPTER II

# THEORETICAL BACKGROUND AND RELATED LITERATURE

This chapter contains an overview of the historical development of the concept of metaphor from Aristotle's thinking to the modern psycholinguistic era. The cognitive processes involved in the comprehension of metaphors are defined by various theories which are presented. Detailed consideration is given to semantic feature models and to their feature interaction rules as a theoretical basis for the Salience Imbalance Model. Different thoughts about the nature of the metaphor comprehension process are provided along with a detailed account of the theory of similarity. The role of semantic features and their levels of salience are an important part of this theory. A relatively large section of the chapter is devoted to the description of the central concepts of salience imbalance (attributes and their equality, directionality in the topic-vehicle relationship, salience and its measure) because they are crucial to the understanding of the Salience Imbalance Theory. Also,a comprehensive description of the theory along with its predictions is given. Finally, an overview of recent literature on children's production and comprehension of metaphors is presented.

## A Historical Review of Metaphor

"As philosophy grows more abstract we think increasingly by means of metaphors that we profess not to be relying on" (I.A. Richards, cited in Shibles, 1971, p.VIl). In spite of this contradiction, the metaphor has finally achieved its well deserved status as a scientific method. With its help we are able to expand our knowledge about ourselves, about society and the world in general. As Nietzsche (cited in Shibles, 1971, p.VII) stated just a few decades before Richards "to know is merely to work with one's favorite metaphors".

Richard's statement quoted above also suggests the extent of differences on the definition and conceptual view of metaphor historically. Breal (cited in Shibles, 1971, p.VII) is absolutely right that "the subject of metaphor is inexhaustible". Consequently, this section will attempt to give only a brief and concise overview of the historical development of metaphor through different ages of our civilization. The selected works and authors on this topic do not necessarily represent their order of significance.

### The Concept of Metaphor

Etymologically the Greek word *metaphora is derived from meta* meaning "over" (trans) and pherein, "to carry". The metaphor refers to a set of linguistic processes in which one aspect of an object is 'carried over' or transferred to another object, so that the second object is spoken of as if it were the first. The metaphor is figurative language because it interferes with the system of literal usage. The form of interference is the transference of terms literally connected with an object. The aim of this process is to achieve a more precise or special meaning.

Metaphors exist primarily in language, in human society and in time. Because these factors are not constant, the notion of metaphor is shaped through time by linguistic and social pressures. Metaphor is a social and historical phenomenon "deriving from attitudes towards language" (Hawkes, 1972, p.5). The chief use of a metaphor is to extend language and create new meaning through it.

## Aristotle and the Classical View of a Metaphor

The art of language was divided into three categories (poetry, rhetoric, and logic) by Aristotle (1960, a translation of The Poetics by H. Fyte) because of his conviction that different purposes require different aspects of the language. The goal of rhetoric is "clarity" and "persuasion" while poetry is involved with "distinctiveness". The metaphor belongs to both of these categories and serves as a tool to provide knowledge through artistic imitation of the social environment as a way of gathering meaning. The metaphor is a departure from the ordinary modes of language and it achieves its effect by its ability to combine the familiar with the unfamilier. Aristotle regarded the metaphor as a decorative addition to language used in special places, times and ways. It is a kind of "added extra" to language, the "seasoning of the meat" (Aristotle, Rhetoric III, 1406a). But he clearly recognized the metaphor's importance as a source of new ideas and freshness in the language. Metaphor became part of the learning process and it assumed a creative function in spite of Aristotle's strong emphasis on language's primary aim to manifest the bare facts of reality. In the same vein Plato disapproved of metaphors as a device of rhetoric used by sophists who were not concerned with truth.

Aristotle's notion of metaphor as some sort of special effect achieved in language in a special way had a strong influence on subsequent classical writings on metaphor. Cicero (1942, p.11) saw the metaphor as a means of giving decorous cosmetic effect to speech. It is a kind of simile contracted into one word which is "put in a position not belonging to it" (Cicero, De Oratore III, 38, 155 ff). The poet Horace (1965, p.12) echoed the view that the metaphor's role is to present harmonious and "true to life" relationships as opposed to exploratory or novel ones. Longinus (1965) prefers the precisely controlled use of the metaphor on "appropriate" occasions. Quintillion (1920) in his work of Institutio Oratorio elegantly summed up the previous beliefs about metaphors by stating that it is nothing more than supreme ornament of style. Consequently, metaphors became reduced to one of the categories of figures of speech.

## The Middle Ages

In Christian society of the Middle Ages, the personal experience, the poet's view of the world tended to be less important than society's view and the collective experience of the society at large. The world was viewed as full of metaphors created by God to communicate his meaning. The object of the poet was to deepen the poem's meaning in relation to a theological framework and ultimately to discover God's message. Restricted in their function, metaphors were viewed as means to that end.

## The Elizabethan Period

The metaphors of the seventeenth century were designed to please on the grounds of formal excellence. The main principles of the Elizabethan metaphor were those of decorum, consistency and coherence. It also had a didactic role to manifest truths and values that carried public assent. Its function was to represent an act of "ordering" imposed on Nature and reinforce an established view of the world rather than challenge it.

The purpose of the Elizabethan metaphor seemed to be to involve the audience in an abstract process. It asked for a response and it required the audience to "complete" the metaphor as opposed to the modern metaphor which is complete in itself.

## Ramus, Dryden, and the Puritans

The philosopher and rhetorician Peter Ramus represents an important formative influence on the nature of metaphor. In his thinking, the metaphor became more logical. He demanded that all comparisons must rest on a logical basis. Ramus meant that poetry was grounded in logic, like all reasonable discourse, and therefore it concerned itself with the arrangement of thought in an orderly manner. In this system there was no difference between metaphors which concern feeling, and conceptual statements which concern thinking. Metaphors were considered to be arguments and had to be constructed on the laws of logic as opposed to " free associations" (Hawkes, 1972, p.24).

The Ramist division of rhetoric into content ('logic' of argument) and form (stylistic embellishment) lead to negative developments. The metaphor became a pleasing device, a fancy dress which did not contribute to the meaning of discourse. As a result, Dryden's metaphors did not arise organically from the inside but rather were "applied" to the argument from the outside.

The emerging Puritan style was also called plain style because the Puritans were anxious to get rid of all decorative elements in language. For them content was more important than form and they had little use for metaphors ignoring their sementic function. The cleavage between metaphor and language, between form and content became complete.

With the rise of empiricism, rhetoric lost its philosophical roots and with it the metaphor lost its philosophical respectability. Locke articulately denounced metaphors and rhetoric as "perfect cheats" because he believed that the figurative use of words was for nothing else but "to insinuate wrong ideas, move the passions, and thereby mislead the judgement ... and to be avoided" (Locke, 1961, p.105-6). The view of the empiricists, which eliminated metaphor as a vehicle of knowledge, prevailed until nineteenth-century romanticism.

## The Eighteenth Century

The constant pursuit of "clarity" and "distinction" finally gave rise to a metaphor which was a pre-packaged, finished product which had no need for the audience to respond to or join in with. These metaphors were regularly unloaded strategically into the text when triggered by taste. The excellence of metaphorical expression was warranted only when it was used with "propriety".

## The Romantic View

The theorists of the romantic era tended to reject the Aristotelian notion that metaphors were "detachable" from language. Instead, they proclaimed metaphor's "organic" relationship to language as a whole. For them, the metaphor was an expression of the faculty of imagination which has the ability of drawing things together and unifying similarities. "The Imagination embodied itself in the form of metaphor" (Hawkes, 1972, p.37).

The Italian rhetorician Vico (1725) rejected Herder's "primitivist" notion of language in which metaphors and symbols were combined to create "mythology". For Vico,"primitive" legends and myths were not lies but metaphorical responses to the world on the part of responsible people. A metaphor was not a fanciful embroidery of facts but a way of experiencing, thinking and living them; an imaginative projection of the truth. This metaphorical thinking was present only in societies which had acquired the capacity for abstract thought. Wordsworth (1963) was committed to the language spoken by man in those societies and considered it vitally metaphorical.

Coleridge's (1969) theoretical contribution to the progression and the development of metaphor is important. A fundamental notion that imagination takes linguistic form emerges from his thinking. This linguistic form is manifested in the association of ideas which generates metaphors. The metaphor, therefore, is imagination in action. Coleridge distinguishes two aspects of the imaginative process. Primary Imagination operates within the "ordinary world" while Secondary Imagination re-works this world. The words are the means which reconstruct a reality from within themselves. The entire process is the process of metaphor in which each element interacts with and is affected by the other. The metaphor involves us, gives us work to do, and gives us responsibility in the creative act. This vitalized metaphor is in contrast with Aristotle and his followers who analyzed only the relationship of the metaphor's elements to each other. Coleridge, on the other hand, seems to take into account the relationship between the metaphor and its audience on the grounds that the imaginative response of those to whom the metaphor is addressed contributes to its final effect. Coleridge's fundamental principle of organic connection of all things is a strong argument against "mechanical" metaphors with precisely arranged elements based on the Aristotelian tradition.

## Some Twentieth Century Views

The emerging logical-positivist view which divided sentences into cognitive and emotive utterances restricted metaphors again to emotions, attitudes and moods during the first decades of this century. Following that, however, other major intellectual streams of thought emerged from the nineteenth and twentieth century "beginnings" (experimental psychology, philosophical-rhetorical tradition, linguistics, psycholinguistics) which spawned research that has led to a more favorable assessment of the concept of metaphor.

Within the experimental framework, the most prominent psychologists of this century made an effort to give an account of the metaphor from a psychological prospective. The treatment of figurative language is present and obvious in the post-content psychology of Buhler; in the mental testing movement which was developed by Binet and later redirected by Piaget; in the interpretation of the Gestalt psychology by Werner and Asch; as well as in the neo-behavioristic writings of Osgood and Brown (Honeck, 1980, p.26).

In analyzing the role of dual function terms, Asch (1958) made an attempt to provide a theoretical basis for the metaphor. He dismissed assumptions about the intrinsic similarities between physical and psychological phenomena which would be a basis for the perceived similarity between the terms of metaphors. Rather, he argued that the double function terms refer to "functional properties or modes of interaction" (p.93).

For Skinner (1957), the sensory qualities of objects grow in significance. He considered the metaphor as a matter of transferring an old reinforced response (topic) to a new stimulus or object (vehicle) which shares sensory qualities with the topic. In a slightly different way, Osgood (1957, p.23) viewed a metaphor in language as a "process" which can be described by "dimensions of experience". Generally there are at least two such dimensions which are aligned in a parallel way and are defined verbally by pairs of polar adjectives. During the comprehension process, "translations" occur between them. Like Skinner, Brown (1958) also underlines the role of sensory qualities in metaphorical expressions. He sees potential in metaphorical interpretations of the names of sensory objects because there is a natural or inherent correlation of sense qualities. The mechanism for this correlation is called "mediated association" (p.142). The role of context was also recognized by Brown after Osgood as an expansion in thought. The lifetime of a metaphor in language depends on its ability to appear in an improbable context. There is an incongruity between the reference suggested by the word and the reference suggested by the context.

When the word is as familiar in its new context as it was in the old, the metaphor loses its novelty and dies. Honeck, (1981, p.31) views this account of metaphor as a "curious mixture of mechanistic associationism, the reference theory of meaning, and a latent tribute to the creative aspect of metaphor."

## Philosophy and Rhetoric

Until quite recently, the thoughts of Hobbes and Locke prevailed in Western philosophy. Particularly British empiricism and Vienna positivism have influenced philosophers' thinking on metaphors by denying any "philosophical seriousness" (Cohen, 1978) or "cognitive content" (Davidson, 1978) to them. The positivists implied that metaphors are nonessential, frivolous, logically perverse, emotive, and do not contain any knowledge or genuine meaning. In spite of this hampering delimitative influence, the philosophical-rhetorical tradition has played a very positive role in current psychological research. Its direct influence is amplified by Richards' and Max Black's work. Language, for the theorist Richards (1936), for instance, is not a medium through which we communicate information about the reality existing outside us "in itself". Rather, language causes that reality to exist. Contrary to old Rhetoric, Richards (1936, p.40) viewed ambiguity of language as the "indispensable means of...utterance, a fundamental aspect of language and not a vice of it to be eliminated". Ultimately, all languages are fundamentally metaphorical because they "transfer relation to reality" and they "contain deeply embedded metaphorical structures" (Hawks, 1972, p.60). In Richards' interpretation, words do not have correct or "fixed" usage because they are determined by other words in the context. As a consequence, he rejected Aristotle's teaching that metaphor is unlearnable, special, idiosyncratic, exceptional or deviant in the use of language. Rather, he viewed metaphor as an omnipresent principle, a function of language itself, the way language works, a kind of "borrowing" between thoughts. Since language is reality, the metaphor expands reality by the juxtaposition, interaction, and "fusion" of its elements. The key words in this analysis are "interaction" and "borrowing". Interaction, for Richards, stands for a relationship between the topic, the vehicle of the metaphor, and their shared attribute which he calls "ground". The intrinsic and fundamental nature of metaphor is represented by the process of borrowing which is viewed as an intercourse of thoughts, a transaction between concepts, domains or contexts. Richards, however, points out that an inherent resemblance between the topic and the vehicle is not a precondition or the only alternative for the successful production of metaphors through "interaction". A variety of interactions may take place between the terms of metaphors ranging from obvious similarities and mutual selection of common features to recondite relationships, random clashes, and disparities. In this sense, the metaphor ultimately creates a new reality. Our views about reality can be made precise with the help of new metaphors since "plain speech is essentially inaccurate (Hulme, 1924, p.134-135).

Richards' best-known pupil, Empson (1930) reiterated that the conscious use of metaphors results in "stretching" the language. The metaphor is constantly engaged in this stretching process. Empson's major contribution is the recognition of the fact that ambiguity is a necessary aspect, an inherent characteristic of language. The metaphor is part of the process of this normal development of language.

Richards' ideas about the concept of metaphor were refined by Black, in the early 1960-s, who presented a distinguishable delineation of the substitution and interaction views of metaphor, arguing strongly for its cognitive status. The notion that language is fundamentally metaphorical and "ambiguous" proved to be central for many modern writers on metaphor. Barfield (1928, 1947) states that the metaphorical process is present not only in "officially designated metaphors" but everywhere in language. The concept of language is further broadened by Wheelwright, for whom the metaphor is the center of language. Language for him designates any element in human experience which is employed "to mean, to intend, to stand proxy for something beyond itself" (Wheelwright, 1962, p.29). The testing of the functioning of metaphor in language, therefore, should not be based on any rule of grammatical form but rather on the quality of semantic transformation that is brought about. Wheelwright recommends the classification of metaphors in terms of these semantic transformations.

Theorizing about the nature of figurative language has also been influenced by recent developments within the philosophy of language. Particularly, the philosophy of the "speech act" (Austin, 1962, Searle, 1969, 1977) and the theory of "conversational implicature" (Grice, 1975) demands notice. The speech act philosophy concerns itself with primary communicative functions of the language, like asserting, warning, commanding, criticizing, promising and so on. It investigates how these functions of language can be achieved and actualized in a subtle, elegant, and indirect way. The reason why figurative language might be treated as an indirect speech act can be found in the inability of the literal utterance to specify the metaphorical meaning in it. In literal language the intended meaning and the sentence meaning are constant. The same is held for the utterance meaning and sentence meaning. However, in figurative language, the utterance meaning and the sentence meaning do not accord. The claim by speech act philosophy that figurative language can be construed within its framework is not without controversy and invites further debate.

## Linquistics and Metaphors

For a better understanding of metaphors as linguistic phenomena, modern linquists have played a major role. They investigated the relationship of figurative language (poetic) to the standard "ordinary" language. The linguistic devices employed by poets help to explore language and expand its potentialities. When a word is used figuratively, some sort of imaginative "linkage" is established with other words. With the help of this linkage the listener or reader will be able to identify the meaning of the metaphor more precisely. The difference between poetic (metaphorical) and standard language is "not in kind, but only in degree" (Nowottny, 1972, p.72). Poetic language is more highly structured, more complex than the language outside of poems. It is more successful in redressing and exploiting the various characteristics of language.

Most of the current and fruitful research on figurative language, interestingly enough, can be interpreted as a reaction against linguistics. For this, to a great extent, Bloomfield and his influential book published in 1933 can be held answerable. This work influenced generations of linguists and successfully promoted the linguist's version of American Behaviorism. The main objective of the linguists' task, according to Bloomfield, is to isolate, segment, and classify the constituents of sentences. The analysis of these elements of the sentence must be carried out without regard to meaning. This was the beginning of structuralism. In this theoretical environment, figurative language, particularly metaphors, were overlooked.

By 1965, a more adequate approach was developed to handle the problem of meaning. Chomsky's new theory, transformational generative grammar, incorporated, for the first time, semantic features governed by lexical selection restriction rules which are assumed to be violated by metaphorical sentences. The semantic features are not allowed to intermingle freely in this system because special rules dictate which features are compatible. Chomsky's theory explains metaphors by elaborating on the function of the restriction rules. A sentence can often be interpreted metaphorically if it breaks these selection restriction rules and if an appropriate context of greater complexity is supplied. The metaphorical sentence is apparently interpreted by a direct analogy to these well formed sentences which observe the selection rules. This theory contributed to a better understanding of metaphors because it helped to categorize relationships between metaphors. However, the linguistic approach to metaphors is sometimes counterproductive. Some linguists presuppose a series of pre-packed metaphors to be unloaded without regard to meaning. There is no such thing as an isolated, freefloating metaphor (similar to Bloomfield's thinking) because its meaning is perceived only in terms of its relationship with the entire context. The modern linguistic analysis of metaphors has the tendency to disregard full context and view metaphors as semantically deviant. Consequently, Matthews (1971) believes that metaphor is a performance problem and a matter of language use.

The emphasis on "rule violations" is another approach by the contemporary linguist Kintsch, (1972, 1974) who integrated this linquistic view with ideas concerning semantic memory. For him, any sentence which is not acceptable semantically has metaphorical potential. A proposition is identified as unacceptable when it discloses deviant qualities and it is not generated in semantic memory. The interpretation process of deviant sentences is characterized by inferencing whereas an explicit comparison is being made involving only semantically acceptable sentences. These sentences replace the original unacceptable sentences. To further explain metaphorical statements, Kintsch introduces the concepts of "analogy rules" and "compression rules". The analogy rules are used to interpret deviant sentences. When compression occurs, on the other hand, nondeviant propositions are "taken into" the original deviant proposition.

## Anthropology

The central characteristic of any reality is the potential for transference from one "ordering of nature" (Hawkes, 1972, p.88) to another. This transferring is metaphorical. "The metaphor conveys the changed and the unchanged about the world at the same time" (Bencze, 1983, p.274). What we learn from anthropology is that reality becomes ultimately the source of our metaphors. In all societies the metaphor has a normative, reinforcing aspect as well as an exploratory one. It will be just as much concerned with what we know as it is with what we don't know. The unknown element is a system of relationships which are presupposed but have not been "brought out". The metaphor, therefore, is a confirmation as well as a challenge.

## The Psycholinguistic Era

The conceptual roots of current research on metaphors can be identified in the material just surveyed. But these sources of figurative language, in a historical sense, do not appear to be a gradually unfolding progression toward the resolution of theoretical and common problems of metaphor. Rather, there is a conglomeration of discontinuities, expansions and retrievals, fascinations and discouragements through time. The works by Werner (1955), Osgood (1958), Brown (1958), Asch (1960), and Nerlove (1960) were mostly ignored during the barren sixties. This period was particularly unfruitful in terms of research on metaphors. The reason for this dry period lays with the fact that most cognitive energies were consumed by the assimilation of Chomsky's generative transformational linguistics in psychology. ~~This focusing of attention by~~ researchers produced a bias toward the confirmation of linguistic constructs as opposed to metaphors. The psychological reality of these constructs became the major concerns of psycholinguistic researchers along with the investigation of syntax and to a lesser extent of semantics. All of this was elegantly disguised by the emphasis on "deep structure". The practice of isolating linguistic structure from linguistic function effectively prevented the metaphor from being recognized as a prominent element of human communication.

A decade passed by before a new round of developmental studies were published (Gardner, 1974; Pollio & Pollio, 1974; Billow, 1975; Lesser & Drovin, 1975), and the 70-s finally brought forth a creative revival in metaphor research. This research has been embodied within the psycholinguistic tradition in a way that has decreased the importance of linguistic competence and enhanced the role of communicative performance. The result of this change in approach and emphasis yielded one of the "most advanced, yet empirically based theory of metaphor comprehension" (Honeck, 1980, p.39) from the pen of Verbrugge & McCarell (1977). The general themes of research, as the result of more powerful theoretical buttressing, have now become available and have been expanded. The psycholinguists included new unconventional research themes in their repertoire of inquiry like individual differences, cognitive styles and sensitivities, creativity, the need for connecting language with imagination, perception and memory, the interest in phenomenology, and the experiencing of challenge, paradox, insight, play and even fun. Many authors have speculated about motivational sources of metaphors because, if figurative language stems from an aroused state, as they argue, metaphorical expression should correlate with emotionality, humor etc. (Anderson, 1964). However, empirical studies on motivational sources of metaphorical language are scanty.

## Theories of Metaphor

A description of the major views on metaphors is the focus of this section, including the substitution, comparison, interaction, transformation, and semantic feature theories of metaphor. This section of the chapter also contains a brief comparison of these fundamental theories of the cognitive processing and activities involving the comprehension of metaphors.

### The Substitution Theory

According to the substitution theory, in a metaphorical phrase, one expression is substituted for another. The one which is substituted is the vehicle, which stands for a literal idea. When Jim's parents note that their son is an "owl" and is always in the library, they do not mean that they have an ornitological case in the family, some unexpected and unexplained atavism, but simply that they have a studious, scholarly son. The expression "owl" was substituted for the literal term of "studious". When Jim was figuratively called an owl, it was an indirect way of representing an intended literal meaning (he is studious).

The substitution view assumes that all metaphorical expressions are used in the place of some equivalent literal expression (Black, 1962; Honeck, 1980). These literal expressions constitute the true underlying intent or meaning which is represented (substituted) by an intruding term (vehicle). To understand this underlying literal intent, the listener must replace the "intruding term" (Verbrugge, 1980, p.99) or vehicle with a literal term (concept) which semantically will be compatible with the rest of the sentence.

It seems that the substitution view of metaphors is most applicable when the properties asserted by the metaphor are known to be true of the topic and the metaphoric term of the vehicle serves as a means to direct attention to these properties. However, the substitution view does not prove to be very helpful when the properties asserted by the metaphor are not known to be true of the topic, when a novel interpretation of the topic is required, when both the topic and the vehicle are of continuing interest (Verbrugge, 1980) or a fanciful experience is presented in the sentence.

## The Object Comparison Theory

The comparison view of metaphors is basically a substitution view which is based on Aristotle's thinking about metaphors. According to the comparison theory, the metaphor is considered to be an implicit comparison of objects. It views objects in terms of how they are alike. During the process of comparison, the two domains of a metaphorical statement are assumed to be independent identities. Black (1962), who considers the comparison view of metaphors as a "special case" (Verbrugge, 1980, p.99) of the substitution view, emphasizes that both domains must be included in the underlying sentence meaning. The meaning of a metaphor, explained by the comparison view, is a literal set of relevant similarities "picked out by the context of the utterance" (Johnson, 1980, p.52).

The comparison theory views metaphor as nothing more than an obscure, elliptical simile; consequently, its "truth claims" are assumed to be nothing other than "its literal paraphrase"(Johnson, 1980, p.55). The comparison view not only treats metaphorical statements but also entire sentences as deviations from normal. It assumes that these sentences have two "levels" of interpretation. On the surface level we witness, falsely, an identity between the topic and the vehicle domain. But beyond this level there exists a "hidden level" (Verbrugge, 1980, p.99) when a comparison of the two terms is stated. When the two domains of knowledge are compared, in spite of their differences, a certain similarity between them is assumed.

Another assumption from the comparison view is that the topic and the vehicle are interchangeable. According to this notion, a metaphorical statement "A is B" has the same meaning as its reversed version ("B is A") where A represents the topic and the B vehicle. To satisfy this assumption of the comparison view, there are two conditions that must be met. First, the metaphorical statement cannot have asymmetry in focus regarding the topic and vehicle domains, and secondly, the similarity relations between the terms must be symmetric.

These conditions are seldom met. In metaphors there is a thematic focus on the topic which is viewed from the perspective of the vehicle. In addition, the shared features between the topic and the vehicle are more closely related to the vehicle than to the topic. The vehicle has a "predominant role...in guiding the interpretation of the topic" (Harward & Verbrugge, 1977, p.101). This asymmetry in focus and roles has been supported empirically by the above authors when they measured subjects ratings of similarity between metaphorical terms. They also found, that the similarity relation between the topic and the vehicle is asymmetric. Tversky's (1977) observations about asymmetry are congruent with these findings. However, Tversky's model is a sophisticated comparison model because it is based on the "stable representation of pre-existing features...It fails to model the changes in similarity that accompany a radical reattunement to the topic" (Verbrugge, 1980, p.101).

The comparison view has other limitations, as well, because it fails to account for metaphors which interpret the topic in a novel fashion. The vehicle exerts a transforming effect on the topic which cannot be accounted for by the assumption of pre-existing features and similarities. There is also a dialectic process involved in the comprehension process of metaphors by accommodating distinct identities and domains for which the comparison view fails to give an acceptable explanation. In spite of these limitations, the comparison view has had a positive impact on the research and understanding of metaphors. It inspired psychologists and linguists (Leech, 1969;

Mathews, 1971; Kintsch, 1974; Mack, 1975; Malgady & Johnson, 1976; Sternberg, 1977; Miller, 1979; Ortony, 1979, 1980, 1985) to develop models which propose mechanisms to account for common features between concepts and which stress their resemblance and similarity.

In 1979, Ortony developed and published a modified version of the comparison theory which can be viewed as a psychological theory because it concerns itself with people's judgments and perceptions of similarity. It is also a theory of similarity into which metaphors are incorporated. A more detailed account of this theory will be given in the section of this paper dealing with similarity.

## The Interaction Theory

Probably the most extended summary of statements on the interaction view of metaphorical processing was given by Black (1962). He named two kinds of subjects in the metaphorical statement, the principal and subsidiary subjects which are regarded as complex in themselves; a kind of "systems of things". The metaphor, according to the interaction view, works by applying to the principal subject a system of "associated implications" characteristic of the subsidiary subject. These associated implications consist of "commonplaces" about the subsidiary subject or vehicle. Black argues that the commonplaces include cultural beliefs, personal attitudes and unusual connotations.

The associated implications applied to the topic alter the topic's system of implications. In the process, "the metaphor "the metaphor selects, emphasizes, suppresses, and organizes features of the principal subject by implying statements about it that normally apply to the subsidiary subject" (Black, 1962, p.44-45). The result is a shift in meaning. Black characterizes the entire process as a "filtering" of the topic by the vehicle. The metaphor acts like a filter wherein the topic is "seen through" the filter of the vehicle or subsidiary subject. This process is considered to be "interactive" because the filter alters the identity of the topic and the topic influences the identity of the vehicle-filter. The filter works both ways creating new meanings. Neither component of this interaction is completely malleable under the influence of the other and no symmetry can be established between the two terms. The vehicle, however, proves to be a powerful transformer and reorganizer of the identity of the topic (Verbrugge, 1977, p.102). Findings compatible with the interaction view were reported by Honeck, Voegtle, and Sowry (1978), Tourangeau and Sternberg (1978), Verbrugge and McCarrel (1977) and Verbrugge (1974, 1977).

The most common criticism of the interaction view of metaphors, which assumes an interplay between attributes of topic and vehicle, is its vague explanation of metaphorical meaning. The other concern about Black's views of interaction (Verbrugge, 1980 p.105) is the very interplay itself between the two knowledge domains. One extreme view assumes that the metaphorical meaning is the result of the total identification, fusion, or some kind of mystical union between the topic and the vehicle. Others believe in the coexistence of two different identities in a single structure at the same time.

Verbrugge (1980) disregards these two extreme positions and adopts a more balanced view. "Total separation and total fusion are not the only theoretical options available" (Verbrugge, 1980. p.104-105). Rather, they are only endpoints in a broad continuum which accommodates degrees of fusion, incongruity, and permanency. A transitional dual identity, a partial fusion of and oscillation between the topic and the vehicle, is the very essence of seeing objects metaphorically.

Lately attempts have been made to extend the interactive theory. Hayne (1975) identified two levels of comprehension of metaphors. First, on the comparative level, characteristics of the vehicle are transferred to the topic in order to say something about it. Secondly, on the interactive level, known characteristics of the vehicle are juxtaposed against the topic and give new insights about it or about a third concept. The result of this interaction will be an "irreducible synthesis" (Hayness, 1975, p.273) which is difficult to reduce into literal language. At this point it is relevant to mention, as Osgood (1980, p.226) pointed out, that the philosophical treatment of the transfer notion in metaphorical production has shifted to a comparison notion between the topic and the vehicle. This tendency is unfortunate because comparison involves a "deliberate, conscious, mental process" (Osgood, 1980) as opposed to an automatic interaction of constituent meanings in the metaphorical phrase.

To better understand the cognitive processes involved in the comprehension of metaphors, in 1980, Johnson developed an "amplified" version of Hayne's "bilevel distinction" model. According to this view, the metaphorical comprehension process comprises two levels: the "canonical" or comparative and the "noncanonical" or interactive levels. The canonical aspect is characterized by a "rule-governed systematic procedure" (Johnson, 1980, p.55) which tells in what respect two objects are similar. In addition to this comparative level of the metaphor comprehension process, there exists the noncanonical level where rules no longer govern. This is the level where systems of implications "belong together" and we experience the insight so characteristic of the metaphorical phenomenon. The cognitive activity can no longer be reduced to the level of comparison, because the interaction between the domains results in structural alterations and in a new formal unity with the involved terms.

## The Transformation View

A similarity statement expressed in the sentence form of "A is B" implies that features or invariants of the B term are applied to the A term. The impact of "B" is assumed to modulate the identity of the A term by its "structural and transformational invariants"

(Verbrugge, 1980, p. 107-108). This "modulation" results in the transformation of the topic into the vehicle. The topic, during the transformation process, however, will not be reidentified completely as the vehicle, and therefore, we can speak only about a partial transformation of the topic. The vehicle with its more salient invariants will be the source of constraints on the identity of the new metaphorical concept, leaving the topic "plastic" under its influence. This "ranking" of terms during the transformational process causes a transformational directionality in the metaphor.

The degree of transformation on the identity of the topic is not always explicable by the sentential and grammatical constraints. The listener's or reader's style plays an important role also. During the comprehension processing of metaphors, the listener experiences a "creative recollection" (Verbrugge, 1980, p.107-108) of knowledge elements guided and catalyzed by linguistic forms. At the same time the listener also experiences a psychological relationship between himself or herself and the language. The transformational view treats meaning as a psychological relationship and the metaphor as "property of a psychological relation" (Verbrugge, 1980, p.121). In this vein Connor (1980, p.284) suggests that figurative relations may normally occur in a "nonlinguistic media and only later be expressed through verbal forms".

The phenomenon of transformation is unconventional, unusual, fanciful, and imaginal. The metaphor created through transformation of its terms often results in images because of its emotiona content or the bizarreness of its meaning when it is interpreted literally. The imagery is viewed by Billow (1977), Honeck (1976), and Verbrugge (1977) as a "useful mnemonic" for comprehending and remembering metaphors (Haris, Lokey, & Marsalek, 1980, p.165). Its powerful ability and its role in the fusion of distinct semantic domains and ideas is acknowledged.

This brief note about the cognitive processing relationship between imagery and metaphor within the transformational view wouldn't be complete without mentioning dissonant opinions. For instance, Riechmann and Caste (1980, p.199) do not believe that unequal terms or domains of meanings have to be fused. They see the fusion of ideas common to all language comprehension and they don't see why imagery should be essential to comprehending metaphors. Imagery, according to them, is a "tangential phenomena" which is essential only at a shallow level of processing.

In summary, an epigrammatic comparison of the different views of metaphor is presented. From this focusing point of view, the substitution theory of the metaphor centers on one domain, while the point of concentration in the comparison view is located in both domains. The fanciful focus of the interaction view on one domain is different again from the transformational approach to metaphors, where a fanciful, directional, and partial fusion of two domains produces the new metaphorical meaning.

The substitution and comparison views of metaphors actually represent an indirect way of obtaining meaning for metaphors. Both theories treat the metaphor as an ambiguous substitution for a hidden, literal meaning. Both theories employ a special mechanism to extract from the metaphor a literal-conventional meaning. They are also similar in their tendency toward treating metaphors as cosmetic, stylistic devices, and in denying "that one could really mean what one says in uttering a metaphor" (Johnson, 1980, p.52).

The interaction and transformation views, in their approach to giving an account of metaphoricity, reflect commonality. Both views propose a directional process, and as a consequence, a strong influence of word order within the metaphor is discernable. They treat metaphors as a "directional and also fanciful alteration of the topic's identity" (Verbrugge, 1980, p.121).

## The Semantic Feature Models

The semantic feature models concern themselves with semantic properties of objects compared in similarity statements. These feature models don't assign the same role to the shared features. Some focus on the topic (e.g. Malgady, 1975; Tversky, 1977); others view the distinctive features of the vehicle as more prominent then the topic (Smith at al., 1974; Harwood & Verbrugge, 1977). A third group of theorists discount distinctive features completely in their models of semantic features (e.g. Johnson et al., 1974).

An abundance of feature models exists and a brief overview will be given of only those which are most significant to the understanding of figurative language. But why is there this preponderance of feature models? One reason which immediately comes to mind is their usefulness. They are helpful and applicable in linguistic theory as well as in cognitive psychology (Neisser, 1976). These feature models are particularly useful in dealing with meaning similarity between topic and vehicle and ultimately they contribute to the better understanding of metaphors (Johnson, 1970; Tversky, 1977; Johnson and Malgady, 1979; Ortony, 1977; Verbrugge, 1977).

One approach to the better understanding of the comprehension of metaphors arises from the quantitatively oriented psychological account of figurative language. We can talk about psychologically based quantitative models of metaphors which use features or a componential approach for their description and measure of figurative language.

Actually, the psychological literature on metaphors can be divided into two theoretical traditions. The focal point for the first tradition is the analysis of the characteristics of the metaphoric stimulus. Researchers are interested in revealing the processes by which these characteristics are transformed into a new metaphorical meaning. This tradition heavily emphasizes featural representation (Smith, Shoben & Rips, 1974; Tversky, 1977; Ortony, 1977; Johnson & Malgady, 1979; Malgady & Johnson, 1976, 1980).

The second theoretical tradition concerns itself with the creative aspect of the metaphor and seeks answers to questions of metaphor production, interpretation, and its role in creative thinking (Pollio et al., 1977; Verbrugge, 1978).

Since Ortony's Salience Imbalance Model is a feature model, and this will be considered in greater detail in a subsequent section, only the first theoretical tradition, which approaches metaphors from a structural-componential direction, will be discussed in this section. To illustrate feature models, Malgady & Johnson's (1976) "associative feature model" will be presented as an example. This model was proposed so as to explain the meanings of words. The associative feature model states that the meaning of words is a set of features. When words are combined, for instance in metaphors, the features of the original words or the terms of metaphor will be added up and the meaning of the combination of the terms will be determined by an "additive summation of the feature set" (Katz, 1982). Those feature elements which are shared by the terms of the word combination will be the most salient. They also show overlapping of their properties. The degree of this associative overlapping of properties in metaphors predicts the similarity among the terms of a word combination as well as the goodness of the metaphors.

However, the associative feature model also predicts that under certain circumstances there is no need for an overlap of features of terms to be employed to obtain a new metaphorical meaning. Instead, a "normative frequency" (Katz, 1982) regulates the metaphoric comprehension process requiring only one or two salient features to trigger metaphorical comprehension.

The Salience Imbalance Model proposed by Ortony to describe and explain metaphoricity places features or attributes of objects compared in a single metaphorical statement into the centre of its investigation. It does so because attributes play a crucial role in the process of how seemingly incongruent objects are seen as similar. The result will always be a new meaning, the metaphor's contribution to semantics. One, therefore, may assume that the understanding of semantics, semantic memory, the nature and structure of attributes, and the semantic feature models is an important theoretical prerequisite to the salience imbalance model of metaphors.

When we comprehend or create metaphors we use "objects", words or "meanings" from our semantic memory. Therefore it is crucial to understand how these meanings from the semantic memory are retrieved and processed. There are two basic models available to describe this process. The net-theoretical models assume that words exist in the semantic memory as independent units or nodes and are connected by labeled relations. The process involved here is of retrieval and comparison.

The set-theoretical models, to which the roots of the salience imbalance model extend for theoretical nourishment, state that concepts are represented by a set of elements. These elements might be viewed as attributes or names of subjects. The set theoretical models, like the salience imbalance model, are based on attributes and on the process of attribute comparison.

Because of the importance of set-theoretical models in the development of later models of metaphorical comprehension and processing, it is necessary to mention at least two of their most prominent representatives. As early as 1970, Meyer proposed a two stage set-theoretical model to explain the role of attributes in the comparison process. This model represents compared lexical items by their intersecting categories and by their own defining attributes as well.

The set-theoretical semantic feature model which was proposed by Smith, Shoben, and Rips, (1974) assumes that meaning is represented as a set of semantic features. Some features of a word's meaning are more essential or more defining while others are considered to be more accidental or characteristic. Those features of words which have definingness are generally more emphasized than the characteristic features of word meaning and play a greater role in categorization situations. In a categorization task, the subjects first consider all the features available. Then they restrict their attention to those attributes which are above some kind of "lower bound" (Smith, 1974) for definingness. This lower bound creates distinction among the features. Those which are above it are called definitive features and those below it are the characteristic features.

This model is different from Meyer's model in several ways. It represents semantic information by semantic features only and it views the concept of features in a broader sense than those features defining a category in Meyer's model. Smith et al's model predicts that the rated typicality of lexical items will reflect the differences in their basic characteristic features. As the typicality of lexical terms decreases so does their rated acceptability. The lexical items, according to this model, have an instance-category (subject-predicate) relationship. The category membership is viewed as a matter of degree. The question now is what is the nature of the processing mechanism which describes the similarity between a semantic instance and its category. Semantic categorization, according to Smith et al. (1974), relies heavily on the features' behavior and on the description of their role in a similarity situation. Their "feature comparison" model presents a two stage description of processing.

In the first stage when two lexical items are compared for their similarity, all of their feature lists are retrieved and compared for the instance and category. Based on that comparison, an overall similarity (X) of the category to the instance is determined and compared later on two criterion levels (C1 and C0). These criterion levels are preset, where C1 stands for high level similarity and C0 for low level similarity. In the second stage, the defining features are separated from the characteristic features which are incidental to the lexical item and then this set of defining features in that instance is compared to the set of defining features in the category.

The first stage can be viewed as holistic because it considers all the features available in the lexical items compared. It also considers the overall similarity of the features rather than noting only those which are similar. The second stage is more selective because it considers and evaluates only the distinctive defining features.

Some parallelism can be drawn between Smith's model and Johnson's (1970) "cognitive feature model". The latter predicts that, in context, when the numbers of shared semantic features between the topic and the vehicle are increased, there will be a perception of an increase of similarity between a and b-terms. The increase of shared semantic features enhances the terms' metaphorical comparison and ultimately creates "better" metaphors. The model predicts that the addition of a modifier to the terms also increases the strength or salience of the features in the feature set associated with the meaning of the metaphor.

The isomorphism in both model's claim lies within their prediction that diminishing differences among features bestows better metaphorical comprehension upon the related terms. The contribution of semantics, the account of semantic feature interactions, and the fusions of meaning for the better understanding of metaphors are very important from the theoretical point of view. In their influence and impact, these concepts can be viewed as antecedents to Tversky's "comparison" and Ortony's "salience imbalance" models of similarity and metaphoricity. It is therefore believed that Osgood's (1979) theory of Abstract Performance Grammar (APG) is also significant at this point. This theory was developed to describe the rules of fine semantic interactions which also have implications for the better comprehension of metaphors.

In the process of obtaining meaning for a whole "constituent" (Osgood, 1980), a fine semantic interaction takes place between constituents, a representation of terms in a similarity statement. The interaction is mediated by semantic features. This fusive interaction of semantic features is governed by rules. Within any constituent of a "simple cognition" (Osgood, 1980, p.219), each semantic feature (component) can have only one "sign" and one "value" at any one moment. The rules for this semantic fusion state that (1) the same sign polarity fusion (+/+ or -/-) will yield "intensification of meaning" (treacherous betrayal); (2) fusions of signed and unsigned (zero) coding of terms of constituents (+/0 or -/0) will yield modification of meaning; and (3) fusion of opposed signs (+/-) will yield cancellation of meaning or anomalies.

These semantic feature interaction rules generate explicit predictions for potential metaphors and similes. When the intensity of coding is equal, it results in no change in the topic meaning. But when the intensity of coding for the two terms is unequal and the intensity is greater for the vehicle (b-term), an increased polarization in the topic occurs. Consequently, the lesser intensity in the constituent will reduce the polarization in the topic.

Since semantic features possess "reciprocally inhibitory" characteristics, a perfect congruence for the constituents (topic and vehicle) is rarely the case. This incongruity generally results in semantic interactions across the constituents and meaning shifts within them. The degree of this shift is the function of the extent of the incongruity. The fusion of the semantic features shows a "leftward" movement or direction from the vehicle ("commentative" into the topical). This observation leads to the dynamics of metaphors and similes. There is interaction between the vehicle and topic, the former being viewed more salient and dominant.

Commenting on Ortony's paper (Beyond Literal Similarity, 1979a) Osgood (1980) emphasizes the identity of thoughts between the theory of Abstract Performance Grammar and the Salience Imbalance Theory. "If one simply substitutes "features" for "attributes","same-sign" for "matching", "opposed-sign" for "inequality", and "intensity (polarization) differences" for "salience imbalance", then it would seem that we are saying essentially the same thing" (Osgood, 1980, p.236). The basic correspondence between the two theories can be summed up by claiming that the shared features or attributes common to both terms of the similarity statement are the basis for metaphorical shifts in meaning.

In spite of the fact that feature models possess research literature of considerable magnitude, they are criticized on a variety of grounds (Harwood & Verbrugge, 1977; Pollio, Barlow; Fine & Pollio, 1977; Verbrugge, 1977; Verbrugge & McCarrell, 1977). The most prominent among the discords is the so called inherent limitation of the feature models in predicting the comprehension of individual metaphors by individual subjects. Johnson and Malgady (1980), although claiming that their theory is not incompatible with the feature models, state that these models fail to distinguish between the experiencing of a metaphorical phenomenon on the one hand and examining its comprehension from an outsider's point of view on the other. Consequently, the feature models are really viewed as "third-person models". The features, these critics say, which are associated with metaphors and "exist in individual heads" (Johnson and Malgady, 1980, Verbrugge, 1975, 1977) do not explain the creative-constructive processes and nuances of individual variations of metaphor comprehension.

Therefore, Johnson and Malgady (1980) offer their solution by considering metaphors as having a "priory set of meaning possibilities". But these meaning possibilities from which comprehension experiences are derived are the very features of the feature models! Verbrugge, a critic of feature models, acknowledges that the comprehension of metaphors is "typically mediated by ...an internal dictionary that permits translation from the...word-images into idea-images that corresponds to referents in the environment" (1980, p.90). Therefore it seems that the viewed correspondence between "internal dictionary" and feature sets "in the head" have conceptual complementary and suggestions of sharp differences or dichotomy between them ~~are~~, perhaps, overemphasized.

## Theoretical Issues and the Functioning of Metaphor

This section of the chapter provides a description of various aspects of the metaphor comprehension process, including its central components, its stages and the role of imagery. A detailed account of similarity and the role of semantic features is given as part of a theory of similarity. It explains nonliteral comparisons, the ways in which literal and metaphorical statements are processed, and the role of the salience level of features.

### Similarity Statements and Metaphorical Comprehension

#### The General Process of Metaphorical Comprehension

The most important and, one might declare, central philosophical problem of metaphors is the evasive issue of metaphor comprehension. Every model which attempts to address this problem must consider the cognitive processes involved in the comprehension of metaphors. The creation and comprehension of metaphors has one aim, namely, to generate and acquire new meanings. A model of metaphor comprehension which fulfills these expectations then can clarify and enhance the metaphor's epistemological status.

From the psychological point of view, Johnson's (1980) thinking is important in this matter. He cites no lesser authority on the nature of human judgement than Kant and his "Critique of Judgement". In his work, Kant identifies a special kind of judgement which involves an "imaginative reflection" upon the formal structure of the field of "representations". The concept of representations is unified by the act of the judgements produced. Kant is also interested in the mental processes involved in the production of judgements. These mental processes are reflective in nature and can be viewed as being involved in the cognitive activities of metaphorical comprehension. Johnson believes that these reflective judgements do not constitute an act of knowledge because they do not involve the structuring of the field of representations. Instead, reflective judgements have their reference only in the judging of subjects' "feelings", which is clearly a psychological approach to the problem of metaphor comprehension.

When members of a given language community identify an utterance as metaphorical, the process seems to involve some strain between the "normal sense" of utterance and the "totality of the speech situation" in which the metaphor occurs. The "semantic resources" of the language collide with one another or with other parts of the speech situation which creates new meaning. It seems that a "precondition" for the creation of a metaphorical meaning is the need to view language resources ("utterance forces", Cohen, 1975) as if they are somehow askew.

People organize their experiences about the world by means of concepts. An imaginative alteration of these concepts yields a new aspect of their experience, a new meaning. The metaphor asserts a formal unity between two domains whereas the ground of this unity goes beyond the objective similarity of these domain subjects. It also asserts more than the assumption of two domains being alike. The comprehension process of metaphors involves a recognition stage of likeness between the two subjects, ideas at the comparative (canonical) level and the establishment of a novel relation through a "distinctive noncanonical activity" (Johnson, 1980). The canonical level is rule governed where a "systematic procedure" (Johnson, 1980, p.55) is responsible for the identification of the aspect of domains A and B on which they are believed to be similar. The noncanonical or interactive level of metaphor comprehension is a stage of cognitive processing where any existence of rules is denied. Instead, objects are viewed as similar or belonging together based upon an intuitive insight. The metaphorical comprehension process is understood as a blend of canonical and noncanonical processes resulting in distinctive cognitive effects. Johnson (1980, p.57) denies the existence of any syntactic or semantic rule which would govern the process of extracting a metaphor's meaning by moving from the literal meaning to the metaphorical. Ortony's (1980, p.20) discussion on the problems of literal and metaphorical similarity statements basically is congruent with the above observations. He emphasizes that all similarity statements are handled by a single, uniform comprehension process. Therefore, the difference between literal, metaphorical, or anomalous statements is not in a different processing mechanism, but in the "properties of the basis of similarity" (Ortony, 1980, p.20). During the process of comprehension of figurative language these properties are identified and investigated. The results of a 1978 study by Ortony suggests that there are two major variables which affect the comprehension of figurative language. One is the semantic nature of the contextual support and the other is the amount of it.

A central component of the comprehension of metaphors is the identification of similarities between the topic and the vehicle. During this process, semantic properties of the vehicle are generated and applied to the topic as well as evaluated to determine which can be accepted by the topic. Since semantic properties are transferred from the vehicle to the topic, but the properties of the topic cannot be transferred to the vehicle, one can talk about a sense of directionality which will be described later in more detail in this chapter. The actual comprehension takes place when the unexpressed ground or shared attributes between the topic and the vehicle are "inferred" (Verbrugge, and McCarrell, 1977; Osgood 1980, p.232. This process requires the elimination of the metaphorical tension by discarding aspects of the meaning of words in the nonliteral similarity statement which are the sources of tension when interpreted literally.

For the sake of obtaining a more balanced picture of metaphorical processes, Malgady's and Johnson's empirical data (1980) are useful. They suggest that factors other than the above mentioned tenor-vehicle similarity may influence the comprehension of metaphors. Such factors might be identified as imagery or pleasantness. By considering, particularly, imagery as a variable in comprehension of metaphors, the concept of idiosyncracy sets in. Under different circumstances it is possible that someone can produce a statement which is metaphorical, but which might be understood by someone else as literal. This phenomenon is explained by the extent of knowledge people have associated with the terms of metaphorical statements. This knowledge might depend heavily on their own experiences.

After briefly touching upon different approaches to and thoughts about the metaphorical comprehension process, one more question has to be answered which is believed to be crucial at this point. As mentioned earlier, an important contribution of metaphors to cognitive disciplines is their capacity to generate new meaning. But actually, can metaphorical utterances be used to make assertions? On this issue the opinions are divided. Some researchers view metaphors as devices with emotive impact and deny their truth-claims. Others acknowledge their heuristic values only (Warner, 1973; Loewenberg, 1975). As noted above, the comparison view acknowledges the assertions of a metaphorical utterance but its truth-value is in its literal paraphrase. Black (1954) and Hayness (1975) hold the view that there are metaphorical truth-claims which cannot be expressed literally. Therefore one might conclude that, at this time, there is no widespread agreement on this important matter.

## Similarity and the Similarity Statement

It is widely believed that a satisfactory analysis of metaphors involves, in some way, the principles of similarity. Because metaphorical language is based on similarity judgements, there exists a need for a theory of similarity which can explain nonliteral comparisons. In this sense, a theory of similarity provides the ground or basis for a theory of metaphors which is powerful enough to explain nonliteral statements.

For a long time, geometric models were used to explain similarity in general. These models interpreted the similarity of any two objects as a function of the distance between their position in a multidimensional space (Ortony, 1979, p.161). Unfortunately, since Euclidean space does not account for the directions measured in it, the geometrical models have difficulty in explaining the phenomenon of asymmetry in similarity statements. In 1977, Tversky presented a contrast model to explain this asymmetry through feature matching. The major criticism of this model concerning asymmetry comes from Ortony who objects to the model's inadequacy in dealing with the problem of "radical asymmetry" (1979, p.161). (This issue of asymmetry will be discussed in more detail later in this chapter in the section that deals with salience).

The real question here is how do we view two objects or phenomena as similar. Our perception of similarity between two objects is not similarity of some respect or other, but as judged similarity of important respects.

To understand a similarity statement individuals introduce, for the first time, a feature or attribute into the schema of the topic which wasn't there previously. Another method used to understand similarity statements is that of producing an increase in the perceived salience level of the matching attributes in the schema for the topic. The reader or listener doesn't seek an identity of these attributes, just their similarity. This similarity of attributes "is the basis upon which similarity rests" Ortony (1980, p.11) declares. The similarity of attributes can be identified as literal (literal similarity statements) or in other occasions as metaphorical.

Since a complete identity of attributes is not the case, similarity can be viewed as a "relation of proximity" that holds between two objects (Tversky, 1977, p.347), an attribute matching process. In this process, distinctive and common attributes of the topic and the vehicle of a nonliteral similarity statement take place. The common features are shared by both terms while the distinctive features (attributes) are unique to the topic or vehicle respectively. According to Tversky (1977), the similarity of the topic (a) and the vehicle (b) can be expressed by the following formula:

$$s(a,b) = \theta f(A \cap B) - \alpha f(A-B) - \beta f(B-A)$$

in which A-B represents features belonging to the a-term only (topic); B-A stands for the features that belong to the b-term (vehicle) but not to a; and finally, $A \cap B$ which stands for features that are common to both a and b. The symbol "f" of this formula represents the measure of the salience level of the features. The parameters of $\theta, \alpha, \beta$ reflect the importance of the common and distinctive features of the terms (a,b) of the metaphorical statement. The A is the set of features for the a-term and B is the set of features for the b-term. This formula of similarity assumes that the similarity of objects is expressed as a "linear combination" (Tversky, 1977, p.338) or contrast of their common and distinctive features. If the measure of the common features is increased, the awareness and sensation of similarity between the terms will increase. The opposite of this process is true also, when a decrease in similarity will be the result of an increase in the measure of the distinctive features of the terms. The assessment of similarity between the topic and the vehicle can be described as a comparison of many qualitative features which represent its components. But, it is possible that statements of similarity depend not only on a match of simple attributes but on some structural isomorphism of the represented knowledge elements of the terms.

## The Classification of Similarity Statements

The perception of similarity makes an important contribution to cognition which depends, ultimately, on people's ability to go beyond the recognition of literal similarity relations between objects and to recognize metaphorical similarity relations. In other words, people are not restricted to perceiving and judging literal similarity only. But how do they differentiate among similarity statements and what constitutes the basis for these "classifications"?

Since viewing two objects or situations as similar is a matter of judgement, a theory of similarity which is offered by Ortony (1980) will be, at the same time, a psychological theory. According to the degree of similarity viewed by individuals, three claims can be made which characterize similarity situations. When two objects are perceived as being literally similar, a commonality is established between them which is based on the importance of the attributes to both entities (terms). If the two objects are perceived as being similar metaphorically, the attributes which they share are not important to both entities but only to the second term and they will be related by metaphorical similarity. But what would happen, a third possibility, if the two objects or terms were perceived as being neither literally similar, nor metaphorically similar? In this case, the statement which expresses their similarity is false and anomalous in some sense. They are not perceived as being similar at all.

In addition to these theoretical claims of similarity statements, another factor, the salience level of the matching attributes as a basis of similarity, plays a crucial role in the perception of similarity and metaphoricity as well as in the identification of these "components" of similarity statements. Accordingly, three classes of similarity statements can be distinguished. Firt, in literal similarity statements the matching attributes are high in salience level for both entities or terms. Second, the similarity relationship between two objects expressed in a similarity statement can sometimes take the form of nonliteral similarity in which the matching attributes are of low salience in the topic and high salience in the vehicle. Under these circumstances some attributes of the second term can't be applied to the topic. These statements in general are understood as metaphors. Third, if similarity statements are neither literal nor nonliteral, theorists classify them as anomalous. There are two sources of anomaly. The first is the existence of trivial matching attributes between the terms. The second type of source of anomaly is the case of "reversed similarity" which occurs when shared attributes are being perceived as highly salient for the topic and of low salience for the vehicle. In some extreme cases, the terms do not share even a low salient attribute. What is common in all anomalous similarity statements is their general inability to fulfil a communicative function. Consequently, the degree of perceived similarity between object domains and the salience level of their shared attibutes is very important in recognizing similarity relationships in general. Therefore, it seems appropriate to devote further attention to a description of the ways in which literal and metaphorical similarity statements are processed.

When there are not enough matching attributes available between the terms, it is assumed that the mechanism of "attempted prediction" (Ortony, 1979, p.173) is used to process similarity statements. It helps people to understand comparisons when there is not enough information available about the terms of a metaphor. This mechanism also helps to find matching attributes for the topic by the attempted prediction of attributes of the vehicle. The process involved is characterized by giving preference to the most salient subschemata associated with the vehicle and by an attempt to make it applicable to the subschemata of the topic.

In similarity statements where the matching attributes are already part of the schemata for both the topic and the vehicle, the salience level of the attributes will be increased through the attempted prediction which will result in a corresponding decrease in observed metaphoricity. This type of similarity statement is called an "attribute promoting" similarity statement.

But sometimes it happens that there are no high salient attributes available which can be applied from the vehicle to the topic. In this particular case, the reader or listener may reorder the salience of the attributes of the vehicle and with the help of this "new" salient attribute he or she will be able to interpret the seemingly incongruent elements of the statement. These kinds of similarity statements are classified by Ortony as "attribute introducing" similarity statements. The reader or listener is challenged to take, generally, the most salient attribute of the vehicle which wasn't previously part of his or her schemata for the topic and attempt to apply it to his or her schema for the topic. The context has an important effect on salience levels in permitting their reordering. During this process, attributes occupying formerly lower salience levels in the attribute hierarchy will be brought forward to a higher level. This promotion is accompanied by an increased salience level for the attribute on a temporary basis. The new attribute will allow the reader to relate the topic and vehicle and impose a comprehensible interpretation on an anomalous statement which previously did not have the potentiality to perform communicative functions.

## The Relationship between Similes and Metaphorical Statements

It is widely assumed that both similes and metaphors involve comparisons of objects. The distinction between them is expressed in terms of explicity and implicity. Metaphors are implicit comparisons (their use is an indirect speech act), while similes are explicit comparisons, direct speech acts marked and recognized by the presence of "like" or "as" in the statement. Similes are associated more with utterances in which feature elements of the domains, and ultimately the domains themselves, retain their separate identity. Similes are treated, viewed, and made symmetrical by the juxtaposition of these attribute elements, along with focusing on their resemblance and the back-and-forth direction of comparison.

Metaphors are more frequently associated with utterances in which elements of one or both domains are transformed in their identity. This results, as opposed to similes, in a distortion in the relative equilibrium and symmetry between the domains and yields a transformed identity. One domain becomes the transformer (mainly the vehicle) and the other will take the role of the transformed (topic) signaling a symmetric division of roles between the domains. When similes and metaphors are compared, generally the later makes the stronger request for transformation of identity. The difference between the two is not categorical but rather a "matter of degree" (Verbrugge, 1980, p.119). There is another important difference between metaphors and similes in terms of the "sincerity postulate" (Ortony, 1980, p.81) which seems to be violated. People basically try to communicate true statements in their written and oral discourse. However, it is obvious, particularly about metaphors, that they say something which is true and at the same time they mean something else and thus violate this truth claim. Metaphors are also distinguished from similes by their contextual anomaly, a condition which occurs if they are interpreted literally, as well as by their intrinsic quality of metaphorical tension.

From the psychological-cognitive point of view Osgood, (1980, p.227) elucidates the difference between metahors and similes as "intensity of coding" of semantic features. He predicts that the polarization of the features will be greater for the metaphor than for the simile. This seems to be in line with the prediction of Ortony's salience imbalance model, where features are perceived as more salient for the vehicle than for the topic yielding a metaphorical experience.

## Description of Basic Concepts of Metaphoricity

This section of the chapter presents, in detail, a description of the basic concepts related to metaphor comprehension. Semantic attributes and their relationship to schemata are discussed. Attention is given to the phenomenon of attribute equality and the role of directionality, and to the relationship between the topic and the vehicle domains and their order. As a crucial concept to the Salience Imbalance Model, salience is also discussed.

### Attributes

#### The Concept of Features

In an attempt to define attributes, places, peoples, events, ideas, and our total environment, are viewed as structures. The components of these structures are called attributes or features. Attributes can be seen as known or suspected, factual or mythical, connotative or denotative, and not necessary true of the domain or structure of which they are a part. This list already suggests complexity even though attributes look like "simple predicates" (Ortony, 1979, p. 176). There is an assumption that attributes can often be equivalent to relations because they are believed to be schema constituents (subschemata) and therefore relational in nature.

The set-theoretical approach to similarity, which the salience imbalance model is based on, describes objects as a "representation of features" (Tversky, 1977, p.327). Fagan (1983, Chapter Three) also views concepts as "clusters of information" which are "based on the abstraction of features or characteristics of that particular phenomenon". This featural information can be categorized as "defining, characteristic, associative, and emotive". Features have a very crucial role in establishing and conveying meaning for a given lexical item. In this sense, the features are semantic features. To establish a theoretical account and a descriptive record of them, one has to turn to and depend on semantic feature models. Any lexical item, according to Smith, Shoben, and Rips (1974), is viewed as a representation of "dimensions". These dimensions form a set around a lexical item. Each of them is associated with "weights" which indicate the importance of that particular dimension in the definition of the lexical item. Those dimensions which possess high weight generally are more important and more descriptive of the meaning of the lexical item than those which have less weight.

The dimensions of a given lexical item show another characteristic or "component" parallel with weights and it is called "value". Values are distributed on the dimensions of every lexical item and their frequency is viewed subjectively. These momentary values are called features. A meaning of a lexical item, therefore, is represented at any given time by a list of values. Each value represents only one dimension of the lexical item with its weights. Tversky (1977, p.340) views these relative weights as being "assigned to features" and they may differ for different people. If instruction is given, for instance, which restricts the "feature space" (looking for specified like political similarity), people will attend only to a certain type of feature and will ignore others. Those features which are ignored will receive "0" weight.

The attributes in Ortony's theory of similarity (1980) are contoured by the following characteristics: properties of, attitudes towards, and beliefs about things being compared. In general, attributes are assumed to be an "amorphous group of associations and connotations" (Ortony, 1980, p.10).

In spite of their complexity, the features of objects in a similarity (metaphoric) statement can be classified as "common" and "distinctive" features. Common features are those which belong to or are shared between the topic and the vehicle. Distinctive features belong only to one object, namely, the topic or the vehicle. The increased number of common features, or the deletion of distinctive features, enhances the similarity between the domains of the similarity statement.

Some theorists object to this conventional interpretation of features. As an alternative to feature models, Johnson and Malgady (1980) have presented their "perceptual theory" which suggests a re-definition of the notion of features along with a different underlying basis for the feature models in use. They write that the comprehension of metaphors involves the "experiencing" of an "essentially perceptual context"(Johnson and Malgady, 1980, p.273).

This phrase basically equates to individual comprehension experiences which are derived from a "priory set of meaning possibilities". But these meaning possibilities are nothing more than the features themselves without any further elaboration on their nature. It seems that meaning possibilities are some kind of categories as opposed to "objects".

Johnson and Malgady also object to the general practice in psychological theory, namely, the overuse of the concept of feature. It is customary to think about features as independent objects or things which exist in the stimuli or in our head. These authors prefer to look at features as "convenient fictions" or "categories of description of objects or meanings (Johnson, 1980, p.267).

### Attributes as Subschemata

Concepts differ from each other because certain attributes of their schema are present in one concept, but they are not present in the other. In this context, attributes are "constituents", characteristic properties, "elements" of the schema of a given concept, that is they are viewed as subschemata. The consideration of attributes as subschemata has further theoretical implications in the representation of knowledge because it is logical to assume that attributes themselves can have attributes and these "attributes of attributes" can also be explained by the theory.

The attributes of attributes or "sub-attributes" play an important role in the processing of nonliteral similarity statements.

Context influenced and most diagnostic or defining attributes which are selected generally require additional fine tuning. If the shared attribute, for instance, is "dark", it can have different degrees of saturation, intensity, or hue in it, and the slight differences in these properties are matched only more or less. Therefore, the perceived similarity of domains in a metaphor can vary. Ortony (1979, p.171) states that "a matching attribute may vary with respect to some of its own attributes". The similarity between terms exists because their attributes share "additional" attributes among themselvs. Some subschemata have the capacity for incorporating information about "inter-attribute" relations, which is information about the structure of the schemata.

### Feature Matching

The objects in the human environment are rich in content. They have many appearances, functions, and relations to other objects. When people face the task of similarity assessment while comprehending metaphors, they select, extract, and compile a selected list of features of the objects in question. Their similarity judgement is based on the matched set of these features which are the products of prior processes. The criterion for a match is that the attributes must be highly similar rather than identical. In other words, the attribute match is based not on attribute identity but on attribute similarity resulting in some metaphoricity associated with it.

## Attribute Inequality

Similarity and metaphoricity depend on the matching of attributes. But how congruent are they and how stable are their meanings? Gyula Krudy (1958, p.492) surprises the reader with the following complex metaphor: "Hallottam lelki pincekrol, amelyekben imbolyogva vilagitott neha a vallomas gyonge fenye". It is a very difficult task to translate a highly poetic text, however, an attempt has been made. "I have heard about the cellars of souls, where, sometimes, weak candlelights of confession flicker". This complex figure of speech contains two descriptive genetive metaphorical statements which can be broken down into two similes: "Souls are like cellars" and "Confessions are like candlelights". To comprehend the second metaphor, the reader searches for common features or attributes in his or her schema. Although this process is highly subjective because of the nature of every individual's schema structure, the most probable choices will be "weakness", fragility", "frailness", "being intermittent", and "easy to extinguish". But further scrutiny reveals that many of these shared attributes do not apply equally to both terms. Is the intermittent, pulsing flickering burning of the candle an identical process to the intermittent, irregular, recurrent, on-again- off-again way that confessions are disclosed? The answer is no, because these attributes are not identical. But the metaphors will be understood because the reader is able to find a sub-attribute, namely the "slowness" which makes the attribute of "intermittent" more similar or resembling in regards to both terms. This phenomenon where attributes which are nominally the same (intermittent, easy to nip out etc.) but that often change their meaning (extinguish fire (light) and stop narration) as they are applied to different domains (confession and candlelight) is the problem of attribute inequality. For this reason, any matching of attributes must be based on similarity of attributes. Attribute inequality has ramifications concerning the salience imbalance theory because it enhances the imbalance itself. Consequently, Ortony (1979, p.168) believes that inequality is a problem and it "has to be dealt with in any theory of similarity that relies on attribute matching".

## Topic-Vehicle Relations

Numerous aspects of metaphorical processing are recognized in the comprehensive notion of topic-vehicle relations. A few will be touched on here while others will be commented upon in other related sections of this chapter.

The terminology used to describe the domains of metaphors is plenitudinous. They are defined as "tenor and vehicle" (Abrams, Bilsky), "principle idea" and "accessory idea" (Blair), "visual sense" and "figurative sense" (J. Boyle, Blair), "independent variable" and "dependent variable" (Feltenstein), "subject" and "transposed term" (S. George, Frentz), "principal object" and "accessory", "tenor" and "vehicle" (A. Kaplan, Kames), "literal subject" and "nonliteral predicate" (Lord, O'Dean, Osborn, Richards), "unconscious tenor" and "conscious vehicle" (Robovit, Ruiz, W. Stevens, Ushenko), "principal subject" and "subsidiary subject" (Black), "a-term" and "b-term" (Ortony). And the list probably can be extended further. This study relies mostly on the use of the terms "topic and vehicle" or "a-term" and "b-term".

In a metaphorical similarity statement, people view a particular order of the a and b-terms more appropriate than the other. They discern the b-term generally as more prototypical than the a-term. The prototypicality of an object is defined by the number of attributes it shares with each member of the category. Tversky (1977) explains this phenomenon by stating that the salience of the prototype f(B) is "greater" than the salience of the prototype f(A).

Ortony (1985), however, does not find this explanation for the behavior of the topic and the vehicle satisfactory. Instead, he favours the borrowed concept of "given/new" contract (Gildea and Glucksberg, 1980; Clark & Haviland, 1977). In a similarity statement the "given" entity is the topic and the new information is the vehicle. The new information about the topic (a-term) is communicated in the vehicle (b-term). This new information is a subset of the attributes of the b-term. To express this new information about the topic in a nonliteral similarity statement, the speaker or reader selects a b-term which has this information in it in the form of very high salient attributes. This process explains why the "attributes to be predicted of the a-term are likely to be more salient with respect to the b-term than with respect to the a-term" (Ortony, 1985, p.7). In their experiment, Connor and Kagan (1980, p.288) arrived at similar conclusions suggesting that the metaphoric vehicle is "more closely related" to the ground of a metaphor than is the topic. To explain the steps involved in determining the ground of the topic and vehicle in metaphor processing, Cerbin (1982) discerns three conditions: (1) the listener or reader must find similarity between the topic and vehicle; (2) the perceived similarity must be based on low/high ordered salience where the attributes of the vehicle possess the higher salience level, and finally (3) they must carry out a directed transfer of high salient attributes of the vehicle to the topic.

The notion of the above mentioned perceived "order" between topic and vehicle had its first emergence, as early as 1962, in Garner's thinking in relation to "uncertainty construct" and became also a central aspect of Malgady's "feature-syntheses approach" model of metaphor comprehension. Uncertainty construct or uncertainty refers to the information value that the topic and the vehicle possess. It is a function of the number of features and their "commonality structure" (Connor, 1980, p.289). It is believed that under the condition where the vehicle is relatively more "uncertain" than the topic, the process of metaphor comprehension is hindered. This difference in ucertainty levels between the topic and the vehicle could lead to a preference of order by the reader in metaphorical similarity statements, wherein the more uncertain term serves as the topic and the term with lower uncertainty as the vehicle.

## Salience

### Concept and Definition of Salience

As in the case with many other concepts, the notion of salience suffers from defining properties. It was already pointed out in the discussion of attributes and subschemata that the former are represented by subschemata which are sensitive to the context. Some of the subschemata available to subjects are irrelevant or inappropriate to the other domain of the metaphor and, therefore, do not play a role in the comprehension process. But there are others which are perceived as more relevant or salient. In this sense, the salience of attributes can be operationally defined as the listener's or reader's estimation of the prominence of a particular attribute which is applicable to the concept or object in question. In our previous example (The souls are cellars"), for instance, the reader estimates subjectively the notion of "darkness" and "deepness" as the most prominent features of the concept of "cellar". The salience of attributes is closely related to the notion of relevance of attributes because salience "tells" how relevant an attribute is in making similarity judgements. At this point it is necessary to further demarcate the differences between the concepts of salience and relevance.

The word salience can be interpreted in two ways. First, it refers to prominence or importance; and second it can be interpreted as relevance. According to Tversky (1977), the changes perceived in similarity are due to the changes in the diagnostic value of certain features. Diagnosticity in this context means that the salience of an attribute can change as a function of the given object set under study. This kind of sense of salience is referred to as relevance. "Relevance is characteristic of attributes with respect to task and object domains rather than with respect to objects themselves" (Ortony, 1985, p.5). Worded differently, it is believed that salience refers to objects while relevance has something to do, among other things, with the analysis of features in the topic and the vehicle. The word salience will be used according to the first interpretation. In this sense, in a multidimensional scaling, salience means the extent to which an attribute is used to discriminate between terms brought together with the intention to create a metaphoric sensation or meaning. According to Tversky, (1977, p.332) there are five factors which contribute to the salience of these terms: intensity, frequency, familiarity, good form, and informational content. Katz (1982) found four characteristics ("indices") of feature salience: dominance, typicality, fluency, and imaginal distinctiveness. The frequency with which a given feature is produced is called dominance. The dominance of a feature associated with the vehicle is a predictor of the goodness of a metaphor. The concept of typicality in this taxonomy represents "the degree of which the property associated with the word is rated as being the best example of the property" (Katz, 1982, p.285). Fluency means "the number of other properties which are represented with the word". And the normative frequency with which a property would be described as the most salient characteristic of one's image of the word is the imaginal distinctiveness.

Ortony, in his study (1985) characterizes salience in terms of applicability, conceptual centrality, characteristicness, importance, prominence, and distinctiveness. But he also admits that these traits "still fail to capture an important aspect of salience" (p.32). There is a possibility that other measures like frequency or "order of mentioning" in an elicitation task "might do just as well".

Among these many contributions to the complexity and sophistication of the concept of salience, the most universal property of a salient attribute is its "readiness" and the "ability" with which it can be brought to mind. This is done with ease because other factors or variables like conventional symbolic values, conceptual centrality, and characteristicness ("deepness", "darkness") all contribute in their own ways to this facileness. Of course it is also true that the more salient a property is, the more readily it is accessible. And the more salient it is, the fewer the objects are that have that particular attribute.

## The Measure of Salience

The theoretical grounding for the measure of salience is laid out in Garner's (1962), Tversky's (1977), and Ortony's (1979, 1985) works. In Tversky's contrast model, the scale "f" is a measure of salience or prominence of the various features. It measures the contribution of any particular common or distinctive feature to the similarity between the topic (the first term or factor of the metaphor like

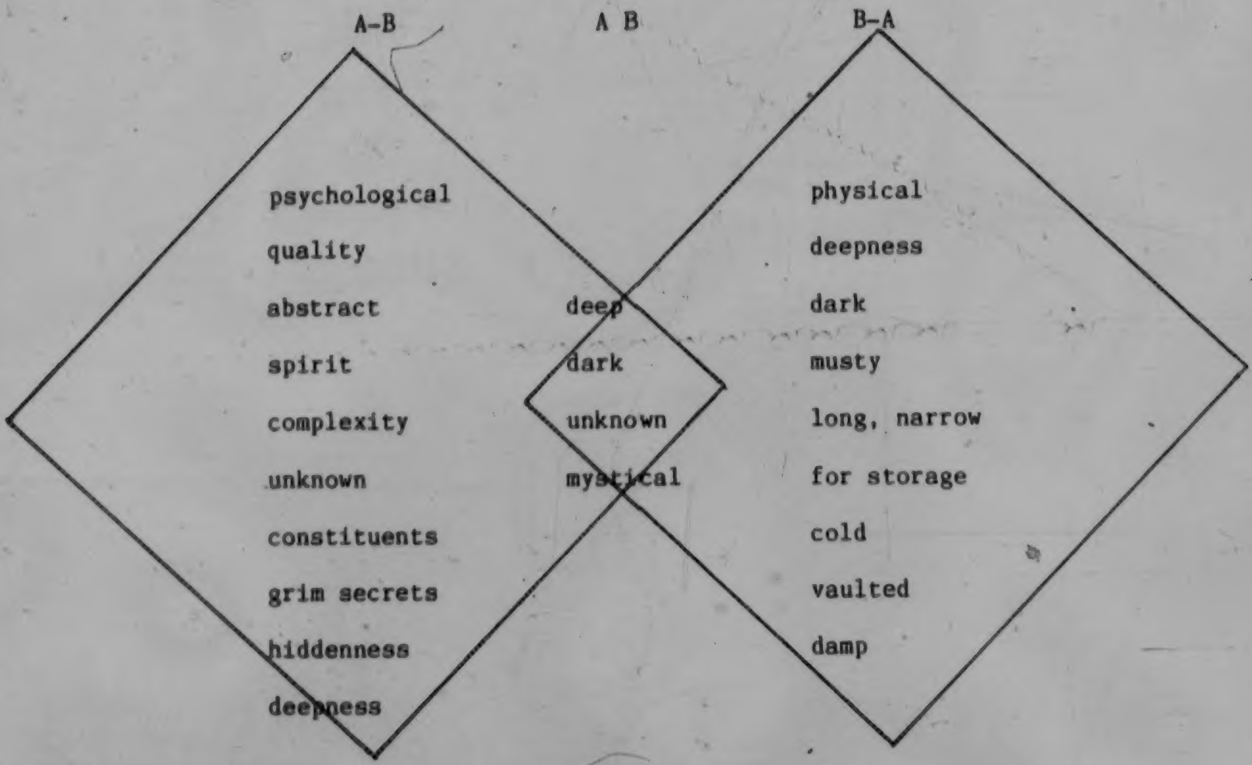
A-B
A B
B-A
psychological
quality
abstract
spirit
complexity
unknown
constituents
grim secrets
hiddenness
deepness
deep
dark
unknown
mystical
physical
deepness
dark
musty
long, narrow
for storage
cold
vaulted
damp

Figure 1. An illustration of the common and distinctive features of a metaphorical statement.

the "soul" in our example), and the vehicle the second term of the metaphor or the "cellar". The scale value f(A) associated with the topic is regarded as a measure of the overall salience of the a-term, and the scale value f(B) is the measure of the overall salience of the b-term. A and B represent all the semantic characteristics (feature sets) that define the topic and the vehicle respectively. Figure 1 presents a graphic illustration of the common and distinctive features in the metaphorical expression "Souls are (like) cellars". The listed sets of features (A-B for the topic, B-A for the vehicle, and $A \cap B$ for the shared features) do not represent an "absolute", permanent, or final number to be established as a precondition to comprehension. The availability and number of viewed features can vary from individual to individual according to his or her background knowledge. An element of idiosyncrasy is involved here which allows for the judging of the quality and quantity of attributes considered in the metaphor comprehension process.

Based on the previously quoted equation for similarity by Tversky

$$S(a,b)=\theta f(A\cap B)-\alpha f(A-B)-\beta f(B-A)$$

it can be determined to what extent the shared attributes (A B) of "deep" and "dark" are viewed to be applicable to both terms. The feature of deepness is probably more salient for the vehicle than for the topic. The two terms of the metaphorical statement, however, share this attribute, because they both have the subschemata or sub-attribute of the "sense of remoteness". The $f(A\cap B)$ (where means "logical product" or intersection of all features for a and b-terms), the f(A B), and f(B A) all represent "information values".

Malgady (1980, p. 247) views these information values of features as "measures of salience". In this line of thought, the feature salience is represented in terms of "average information value" or "psychological uncertainty" of the topic and the vehicle. The topic and the vehicle are viewed as a feature set (A and B), a list of n semantic properties, and the meaning for a and b is defined by these features. The amount of "informational uncertainty" present in the sets is the function of the n semantic features in the terms of the metaphor and is assumed to be expressed in the number of "bits". The salience, or informational uncertainty (U) in the A set (A= {a1,a2,a3,...an}) is expressed by Garner's (1962) equation. Because the measuring of a and b is defined by the semantic feature set A and B, the measure of salience for the topic can be stated by the following formula:

$$f(A)=\frac{-U(A)}{\log 2n}$$

In relation to the problem of measuring salience of an attribute, Tversky's contrast model assumes that the salience of an attribute is independent of the object (topic or vehicle) for which it is an attribute. Ortony (1979, p.163) is in disagreement with this assumption because if the salience of attributes is considered to be independent, it would mean "that the measure of an attribute's salience would be constant and that it would contribute a constant amount to the overall salience of the stimulus".

The contrast model defines "f" as a function of attributes without regard to their origin. It focuses on relevance. In the salience imbalance model, fA and fB represent the measure of salience which is based on the values in A and B respectively. Its measure of salience focuses on an attribute's salience as opposed to relevance. "The measure of the shared attributes depends only on their salience for the second term" (Ortony, 1985, p.9). However, it is difficult to measure the absolute and relative amount of salience an attribute contributes to an object along with the amount of knowledge the subjects have about the objects of a metaphor.

In comparing the contrast and salience imbalance models in terms of measurement of salience of attributes, certain limitations of the models become evident. One of these, as was pointed out previously, is the focusing on relevance and salience respectively. To solve this problem, Ortony (1985, p.33-34) proposed a "combined model" which would integrate elements of both models. In this model "Xi" would represent the shared attributes, "h" the measure of salience, and "h(Xi|a)" and "h(Xi|b)" the salience of shared attributes with respect to a and b terms. This model would accommodate the fact that the salience of Xi with respect to the topic would be different from its salience level relative to the vehicle. The overall measure of salience for Xi (the intersecting common and distinctive features) should be the additive function of the salience values for a and b

$$h(Xi)=Wa(Xi|a)+Wbh(Xi|b)$$

$$\text{where } Wa+Wb+1$$

Since the salience imbalance model assumes directional similarity, that is the perceived level of salience of a shared attribute is higher for the b-term and lower for the a-term, the assumed weight for the topic (Wa) will be 0 and the assumed weight for the vehicle (Wb) will be 1. In nondirectional similarity statements an equivalency of Wa and Wb can be assumed.

This model also suggests the incorporation of the other kind of salience, relevance, into the model. Consequently, the measure of salience for Xi would be the additive function of g(Xi) and h(Xi) for all values of i where g(Xi) stands for the measure of relevance. Tversky also made an attempt to measure salience and relevance as early as 1977 (p.338), but his measure of salience for shared attributes is the product function of h(Xi|a) and h(Xi|b) as opposed to the additive function proposed by Ortony. The salience of a given shared attribute is comprised from the salient elements or constituents of both terms; consequently, their combined effect has to be accommodated by "addition" as suggested by Ortony.

## Factors Determining Salience

There are two factors that determine salience of a feature: (1) intensity and (2) diagnosticity. The intensity of a feature is decided by perceptual and cognitive factors that are relatively stable across contexts. The intensive factors of a feature include size, brightness, loudness, saturation, frequency, vividness etc.

The concept of diagnosticity is concerned with the discriminality of an object from other objects with which it is classified. The diagnosticity principle maintains that the perceived similarity of two objects may change when these objects are placed into or associated with different groups. When a change in the grouping of objects takes place, it will induce changes in the diagnostic value of the feature also. This is referred to as the classificatory significance of features. In the previously quoted example, "the soul is a cellar", the similarity of the two objects was based on their common attributes of darkness and deepness. However, when the vehicle of the sentence is changed and the new sentence appears as "the soul is Dracula", as opposed to the "soul is a cellar", an important change takes place. The categorization or clustering of "cellar" with other objects already included in the category has been enhanced with a new member (Dracula) resulting in changes in the diagnosticity value of "darkness" and "deepness" by suppressing and replacing it with "cruelty", "viciousness", and "barbarism". The perceived similarity between the soul and the cellar was altered by the presence of a new member (Dracula, the uncivilized Romanian tyrant) in the cluster of objects. "The diagnostic value of a feature is determined by the prevalence of the classifications that are based on it, which change with context" (Tversky, 1977).

Any addition or deletion of an object to or from a cluster can alter the clustering of the remaining objects. This change in grouping will increase the diagnostic value of a feature, and with it the similarity of the objects in that set. Diagnosticity involves a relationship between similarity and grouping.

Another phenomenon which affects the salience of attributes in a metaphorical similarity statement is known as "foregrounding". In their attempt to comprehend metaphors, people may reduce the degree of metaphoricity by specifying the dimension of similarity. The effect of this "specification" results in the identification of "foregrounding" (Ortony, 1979) the most diagnostic attributes. The salience of this attribute will increase above the salience of all the other attributes which have less impact or significance on the similarity of the objects. The result will be increased similarity whereas high-salient attributes are matched with high-salient attributes. Ortony's model claims that "the prediction that perceived similarity increases follows readily" (1979, p.170). However, the decrease in metaphoricity, and the increase in similarity between two objects in relation to the "foregrounded" attribute can vary. With its increased salience, the foregrounded attribute can be more or less matched with the topic and the vehicle, because in the matching process attributes of attributes are considered. Foregrounding promotes the salience of some attributes with the result of reducing the degree of metaphoricity in the metaphorical similarity statement.

## Metaphoricity and its Sources

Since metaphors are similarity statements, metaphoricity is viewed as a characteristic of similarity statements. The resemblance between objects is hidden in metaphors. Metaphoricity can be defined as the degree to which comparison of objects is one of literal similarity versus a nonliteral (metaphorical) comparison. Supported by theoretical arguments, it is believed that metaphoricity is represented in terms of the "relative degrees of salience of matching (or matchable) attributes" (Ortony, 1979, p.161) in the two objects which are compared in similarity statements.

There are two main sources of metaphoricity which are known as attribute inequality and domain inc[illegible]ence. The first concept depends on inequality between the relative salience levels of matching attributes in the topic and the vehicle. The attribute inequality enhances the metaphorical effects of salience imbalance (I(a,b)). The degree of salience imbalance between attributes of the topic and the vehicle can be equated with the actual degree of metaphoricity. The more literal a similarity statement is, the lower will be its degree of metaphoricty because the matching attributes have a high degree of salience in both a and b. The contrast between salience levels of attributes forms the basis for a measure of metaphoricity. The locus of metaphoricity is not in the surface structures of the similarity statement, for instance by using or not using the conjunction "like", but rather in the underlying deep structure, the comparison itself.

The second source of metaphoricity is domain incongruence where there are no genuine attribute matches. In a domain-congruent interpretation, the perceived similarity rating is higher while a domain-incongruent statement is characterized by a higher metaphoricity rating.

## Salience Imbalance

### Symmetry of Similarity Relations and Variables which Affect Symmetry

The interpretation of the concept of symmetry is essential for better understanding and description of the salience imbalance phenomenon. Symmetry, in the literal sense, refers to a corresponding condition and similarity between opposite parts of objects in size, shape or position. In a literal similarity statement, symmetry holds between the two terms compared when the objects of the terms are equal in measure of salience ($f(A)=f(B)$ and the task is non-directional ($\alpha = \beta$). The direction of the similarity statement of "a is like b" and "b is like a" depends on the salience (prominence) of the stimuli. If one is more salient than the other (a or b), asymmetry will be the result between the topic and the vehicle. A similarity relation, therefore, can be symmetrical only if "a is like b in exactly the same respect in which b is like a" ( Ortony, 1979, p.171). This relationship can never hold for nonliteral similarity statements because they share high salient attributes for the vehicle and low salient attributes for the topic.

There is an inverse relationship between symmetry and the previously discussed concept of metaphoricity. If the perceived degree of metaphoricity is lower in a given comparison, it will be viewed as more symmetrical. The symmetry between the comparative terms is considered to be "pure" when the topic and the vehicle actually are interchangeable.

Besides the role of salience and metaphoricity, there are other variables which affect symmetry. The relative amount of knowledge associated with the terms can be considered as such a variable. The low/high salience of attributes in a metaphorical statement is not a property of the metaphor. It is the interpreter himself or herself who perceives the matching attributes between the topic and vehicle with low/high salience. This means that during the comprehension process, a subjective factor is also involved. When the speaker creates a metaphor with an asymmetrical low/high condition, there is no assurance that the metaphor will be perceived by the listener in the same way. The subjective factor presents itself in the schemata-structure of the listener for the topic and the vehicle. Therefore, Readance et al. (1984, p.666) concludes that "the low/high condition is something that is partly in the metaphor itself (author's intention) and partly in the mind of the reader". In this vein, whether a similarity statement is metaphorical or literal, asymmetric or symmetric depends on the interpreter's schemata or knowledge and appears to be, as a consequence, idiosyncratic.

Another factor affecting the symmetry of terms in a similarity statement is their natural order. It is conspicuous that the deviant object takes the subject position and the more prototypical one, the object position. This residual effect which causes asymmetry to a large extent can be handl~~ed~~ by Tversky's contrast model by giving less weight to the distinctive features $(\alpha > \beta)$ of the second term. Symmetry can also be established between terms with the help of linguistic devices. The previously described phenomenon of foregrounding, for instance, is used to reduce metaphoricity by emphasizing certain attributes. This will result in higher similarity and symmetry between the objects of comparison.

## Asymmetry and the Focusing Hypothesis

Similarity between objects does not necessarily mean a symmetric relationship. In a similarity statement like "a is similar to b", people focus their attention on the topic (a). Consequently, they weigh more heavily the features of the topic than the features of the vehicle. By emphasizing the distinctive features of the topic, the similarity level between the topic and vehicle will be reduced and the directionality along with symmetry will increase. The direction of asymmetry is determined by the relative salience of the topic and the vehicle. "The less salient stimulus is more similar to the salient stimulus than vice versa" (Tversky, 1977, 9.333). The topic is more similar to the vehicle than the vehicle to the topic because the vehicle generally is more salient than the topic.

In judging the similarity of the terms of a metaphorical similarity statement, the distinctive features play an important role. The number of features common to the topic and the vehicle is constant regardless of their order. Consequently, the asymmetry in judging the similarity relationship between the topic and the vehicle and between the vehicle and the topic will be a function of distinctive features. If $\alpha \neq \beta$ and $f(A) = f(B)$, then asymmetry can be defined formally as follows:

$$S(a,b) \neq S(b,a)$$

Tversky's focusing hypothesis which implies that the direction of asymmetry is determined by the relative salience of the topic and vehicle, therefore predicts that $S(a,b) > S(b,a)$ if $\alpha > \beta$ and $f(A) > f(B)$. The focusing hypothesis assumes that "individuals focus on common features, but distinctive features are equally weighted" (Malgady, 1980, p.253).

Under the condition in which the vehicle is more salient than the topic, the focusing on the topic suggests that the topic to vehicle similarity will exceed the vehicle to topic similarity because, in the latter instance, more distinctive features are emphasized. Giving the example of "The confessions are candlelights", the atypical confessions are more similar to the candlelights than the candlelights to the confessions because the vehicle of the statement possesses additional distinctive features (size, shape, color, the quality of burning etc.) which the abstract topic does not. Or using a different example, Canada will be viewed as more similar to the USA than the latter to the former because of the discriminating distinctive features of the USA (larger population, industrial and military might etc.) make it more salient and less similar causing an asymmetry between the terms.

In their study (1980), Malgady and Johnson presented college students with noun pairs and metaphors. The students were asked to interpret the metaphors and to make directional judgements of the similarity of the tenor and the vehicle. The overall purpose of the study was to assess the predictibility of Tversky's model for asymmetry of tenor-vehicle similarity judgements. The "statistical analysis indicated a highly significant correlation between predicted and obtained values, with substantially greater values indicated when the tenor was the least salient" (Malgady & Johnson, 1980, p.251) confirming Tversky's focusing and asymmetry hypotheses.

The same authors conducted a second study (1980, p.252-255) which was designed to investigate the suitability ~~of~~ the contrast model for predicting contextual effects on judgements of topic-vehicle similarity, "figurativeness" of similes, and to compare several versions of the focusing hypothesis. Malgady and Johnson found that individuals who were processing the "figurativeness dimension" paid greater attention to the distinctive features of the vehicle than to the topic. This finding contradicts the predictions and expectations of the contrast model. Another study by Harwood and Verbrugge (1977) reported a similar finding from a similarity judgement experiment which induced them to question Tversky's (1977) assertion that the topic is the focus of a directional judgement task.

## Directionality and its Influencing Factors

A similarity statement, as was pointed out earlier, consists of a subject (topic) and a referent (vehicle). It takes the form of "a is like b" which, in most cases, can not be reversed ("b is like a"). The similarity statement is recognized as directional because it assumes a certain sequence of its components. The cause of this directionality is the salience level of the subject and the referent (vehicle). People tend to select a more salient vehicle which results in an asymmetrical similarity relationship between the topic and vehicle. In the sentence "Edmonton has the sophistication of Toronto" the stronger salience level of Toronto does not allow for the interpretation of the similarity relation in the opposite direction. ("Toronto has the sophistication of Edmonton").

The concept of "directionality of influence" (Verbrugge, 1980, p.104) emerged relatively early in theoretical works about metaphors. Black, for instance, rejected the notion of topic-vehicle relations interpreted as a symmetric juxtaposition of terms. Instead, he elucidated the concept of metaphors as a product of asymmetric filtering or transformation of the topic by the vehicle. However, this explanation is viewed by contemporary eyes as limited in its scope. Connor (1980, p.303) observed that certain "metaphorically related concept pairs strongly imply directional comparisons while others do not". It is a logical conclusion from this finding that the content of the concepts can be assumed as a key factor in determining the natural direction of the comparison of terms. The findings by Verbrugge and McCarrel (1977) seem to support this line of thinking by providing evidence that the vehicle may be the element "more closely associated with the metaphorical ground" (Connor, 1980, p.303).

Metaphorical sentences which have the form of "a is (like) b" are not symmetric equations or equivalent relations. Verbrugge (1980) calls them sentences which are not "psychologically symmetric" (p.115), that is directional. The sentence plays an important role by directing the attention differently to the topic. Its grammatical subject specifies the "psychological subject" or focus of attention. This account of directionality is compatible with the findings mentioned previously, that the sentence subject establishes what is "given" and the predicate or vehicle presents what is "new". Other factors, like the order of words or a directional bias, also can exert influence on a metaphor's directionality. The factor of directional bias usually favours one member of a given pair of noun phrases by ignoring their order in the sentence. Verbrugge, (1980, p.109) gave ten sentences each containing one metaphor to 24 young adults. Each subject received ten metaphors. The figurative sentences were in the form of similes and metaphors. The order of the terms were both in "a is b" and "b is a" sequence. The subjects were asked to write out the description of "images" and "thoughts" which came to their mind. A strong effect of word order on the perception of directionality of transformation was found, although Verbrugge admits that this effect was "overridden to some extent by a preference for taking one of the two domains as the focus of the transformation" (p.121). (Approximately 12 percent of the subjects focused their attention on the vehicle giving a "b is a" response). Based on these findings one might conclude that the directionality of the metaphoric process can be influenced as much "by intrinsic differences in subject matter as by changes in sentence structure" (Verbrugge, 1980, p.118).

## Order Dependent Asymmetries and the Role of Hierarchy

In terms of generating new meaning, a further analysis of metaphorical statements is suggested which will reveal the constructive role that the order of terms play in this cognitive process. During the comprehension process of metaphors, a new meaning is formed about the topic and about the vehicle which acts to structure the nature of this new concept. These beliefs are widely shared among theorists and even those who suggest some kind of modification of the topic and the vehicle during the process of creating a metaphor admit that the modifacation of the terms is asymmetrical. Among them is the prominent I. A. Richards (1936, p.122) who states that the vehicle controls the "mode in which the topic forms".

In 1977, Harwood and Verbrugge designed a study in which they reversed both the order of topic-vehicle pairs and the order of judgement statements. As a result of their experiment, a significant asymmetry in similarity between the domains of metaphors emerged as a function of order of presentation of terms. In other words, the study proved the existence of order dependent asymmetries. However, it also has to be pointed out that the data on asymmetries did not provide unequivocal support for Tversky's model because the asymmetries were not precisely the form specified by this model. In spite of these limitations of the results, the findings are significant because they provide further evidence that at least some metaphors are asymmetrical and that they "work better in one direction than in the other" (Connor, 1980. p.290).

Another approach to and speculation about the nature of directionality is the existence of an assumed hierarchy among the metaphorical terms. This hierarchy, which was proposed by Kogan (1980) and Kogan, et al., (1980) is formed from such categories as humans, animals, plants, or events. When objects are compared which belong to different "levels" of this hierarchical system, the object at the higher level will more likely fulfil the role of the topic of this comparison and the member at the lower level of the hierarchy will function as the vehicle. Accordingly, the comparison of objects from different levels will be the source of directionality in metaphors. Those comparisons, which are composed of objects from the same level in the hierarchy, are considered to be symmetrical. Among the reasons listed why this might be the case is the "status" of the topic which comes to mind first. This element is regarded as having the greater interest for the reader or the listener and it is the main idea upon which the attention is focused. It is more complex or more ambiguous than the vehicle to which it is compared. The primary purpose of the metaphor is to convey some new idea or interpretation about the intricacy of the topic with the help of the second term. The vehicle, in turn, is characterized by a simpler but more salient structure with a metaphorical quality in it.

It is reasonable to assume that there exists a continuum in this hierarchical system from persons to objects yielding an increasing degree of ambiguity. The higher order categories of persons and animals assume more relationships and belong to more contexts than plants or objects. Connor and Kogan (1980) argue that if the topic emerges from the higher end of this continuum and the vehicle from the lower end, "it would then be possible for the vehicle to restructure the perception of topic" (p.290-291).

In their experiment, the above quoted researchers presented high school students with metaphorical sentences and metaphorically related terms in both pictoral and verbal forms. They were asked to perform "preference" and "production" tasks. In the former, subjects were choosing between sentences with different topic-vehicle structures while participants of the production task were requested to write a metaphor or simile based on the given metaphorical terms. The aim of this study was to obtain information about the topic-vehicle structure of metaphors and the perception of grounds by subjects.

The assumption that, in comparisons drawn between higher order (human) and lower order (nonhuman) elements, the subjects would assign higher order elements to the role of the topic was confirmed. In both pictorial and verbal items the symmetrical elements involved comparison between humans on the one hand, and objects, plants, animals, and physical events on the other. In all cases, the person served as the topic of the statement.

This proposed hierarchy among elements or domains of metaphors which was designed to give an explanation of the phenomenon of directionality rests on the notion that the comparisons are carried out between more "ambigious" topics and less ambigious vehicles. Ambiguity in this context means that the larger the set of potential properties for a concept, the more meaning possibilities it has in the interpretive process (Johnson & Malgady, 1979). The concept of hierarchy between metaphorical terms does not suggest a rigid framework for topic-vehicle relations and metaphoricity but rather should be considered as a heuristic device to organize our thought. The well learned and powerful habit of working from left to right also may contribute to decisions about sentences or phrase structure.

## The Salience Imbalance Theory (Model)

The theoretical foundations of the Salience Imbalance Model are provided in this section along with the deliniation of its imparity and difference from the contrast model. An overall description of the model is presented with emphasis on the concept of salience. This section of the chapter concludes with a list of predictions of the Salience Imbalance Model.

### A general description of the model, its purpose, and its parameters

There are two theoretical constructs of the salience imbalance model. The first is the concept of knowledge representation (schemata theory) and the second is the concept of salience itself.

It is believed that knowledge is represented in the form of embedded schemata. Elements or tokens of schemata are shared by other schemata and can be viewed as subschemata. They are described as attributes of the schemata and are very sensitive to context. However, not all of them are involved in the comprehension process. Some attributes or sub-schemata in a particular situation might turn out to be less important or even irrelevant. Their participation in the comprehension process is limited by the context.

The second important theoretical concept is salience. Context has a limiting function in the selection of attributes for processing information by assessing the concept's salience level. The salience level of an attribute can change "as a function of context" (Ortony, 1979, p.162). People select attributes by estimating their prominence or salience in the context. The selection process is important because the identification of salient attributes is indispensable to the comprehension of metaphors. The topic and the vehicle must have matching attributes but their salience levels cannot be equal. If they were equal, the resulting statement of interpretation would be literal. Therefore, a metaphor is comprehended when the subject is able to identify matching attributes for both terms of the metaphor which are not of equal salience. For instance, "darkness" and "deepness" in the "Souls are cellars" are more salient for the cellar (vehicle) than for the souls (topic). The difference in the observed high salience for the shared attributes for the topic and the low salience for the vehicle is referred to as salience imbalance. The imbalance can be conceptualized by visualizing the attributes belonging to a and b-terms as a list with the most salient attribute at the top. In this sense, we assume a "salience order" wherein the set starts with the most salient attribute at the top of the list and ends with the most trivial attribute at the bottom. Therefore, salience imbalance can be thought of as a contrast of attributes between the terms of metaphors, an imbalance in the salience levels of matching attributes of the terms. It is a degree of diagonality from attributes in the vehicle to attributes in the topic. The salience imbalance is directional because the matching attributes must be viewed as more salient in the vehicle than in the topic and they cannot be trivial. This is also referred to as the low-high condition. The imbalance is measured (Ortony, 1979, p.164) by the "combined effect of the difference in salience between the matching attributes for a and for b together with the (independent) degree of salience in each". This is expressed in a formula as follows:

$$I(a,b)=g[f^{B}(x_{i},\ldots,x_{i+n})-f^{A}(x_{i},\ldots,x_{i+n})],$$

where $\{x_{i},\ldots,x_{i+n}\}=A\ B$ and "g" is some "additive function". Ortony's salience imbalance model is basically characterized by its two fundamental hypotheses, namely salience imbalance and asymmetry. This last phenomenon, a consequence of salience imbalance, occurs when the terms of a metaphor are reversed and cannot be interpreted meaningfully because the shared attribute is more salient for the topic than for the vehicle.

The main objective or purpose of the salience imbalance model is "to provide a measure of similarity that is sensitive to metaphoricity" (Ortony, 1979, p.162) and ultimately to replace Tversky's (1979) measure of salience of shared attributes with a measure which is based on the salience levels of attributes in the vehicle only.

## The Comparison of the Salience Imbalance and Contrast Models

As a combination of the measure of common and distinctive features, the contrast model is an important theoretical antecedent of the salience imbalance model. Its predictions, however, are not without controversy. This fact, therefore, justifies a final effort to delineate their differences and underline the postulatory and conjectural prognostications of the salience imbalance model.

A major theoretical difference between the contrast model and the salience imbalance model is that the former assumes that the salience of attributes are independent of the objects or terms while the latter claims that it is dependent.

The explanation of asymmetry in similarity statements is very discrepant in the two models. The salience of intersection does not change as a result of reversal in the contrast model but it changes in the salience imbalance model because the latter views asymmetry as a result of differences in measured salience of intersecting attributes for the b-term. The contrast model, by Tversky, does not have the theoretical machinery to predict greater asymmetry of domains in metaphors because aymmetry is accounted for only by the focusing hypothesis ($\alpha = \beta$). The measure of common attributes "is independent of the order in which the two terms are presented" (Ortony, 1980, p.81). The salience imbalance model corrects this incomplete approach in accounting for salience imbalance by weighing "$\alpha$" and "$\beta$" differently. It assigns a higher salience for the term which is preferred in the b-position. The measure of shared attributes by the salience imbalance model tends to be higher than the level measured by the contrast model. This is possible because the salience of shared attributes is determined by the domineering position of the b-term. However, the imbalance model can be viewed actually as a contrast model itself because it was developed to "provide a better account of the asymmetry of judged similarity" (Ortony, 1985, p.8.).

## Claims and Predictions by the Salience Imbalance Model

The nonliteral similarity statement is a complex phenomenon. In an attempt to describe its complexity by a comprehensive model, one confronts numerous issues and questions emerging about the nature of perceived similarity between objects, about asymmetry and reversibility of similarity statements, and about meaning change. The salience level of attributes in the terms of metaphors, in shared attributes, and in reversed statements is of utmost significance also. In regards to the above issues, the salience imbalance model makes the following predictions:

1. There are differences in similarity of terms of metaphorical comparisons as compared to literal and anomalous comparisons. This is possible because the salience imbalance model allows the measure of the interaction to be affected by the order of the terms of the metaphorical comparison.

2. The terms in metaphorical similarity statements show greater asymmetry of judged similarity and meaningfulness than the terms in literal or anomalous similarity statements.

3. The reduction of perceived similarity in reversed terms of metaphorical similarity statements will be larger than for literal or anomalous statements.

4. The metaphorical similarity statements will tend to be much less reversible than literal similarity statements.

5. The meaning of similes (metaphorical comparisons) will be more affected by term reversal. In cases in which reversals still result in meaningful comparisons, the meaning change will be greater

for similes than for literal statements.

6. The measure of common features $\{f(A \cap B)\}$ will be low in reversed metaphorical similarity statements because under the reversed condition it is unlikely that there will be high salient attributes of the b-terms to be shared with the a-terms. There is an inherent imbalance in the salience of the relevant attributes which are shared by the a and b-terms. Therefore, if similes are reversed it creates radical changes in the perceived similarity of the objects in a and b-terms.

7. There are no high-salient attributes of b-terms in the intersecting set for a reversed metaphorical statement. This will result, as was indicated above, in a low measure for the common features.

8. The salience of the shared attributes in metaphorical statements will be lower for a-terms than for b-terms. This difference in the salience level results in a high degree of imbalance which will not be characteristic of literal or anomalous comparisons.

9. A change in the salience level of matching attributes should result in changes to judged metaphoricity and similarity.

10. The salience of the attributes involved in metaphorical similarity statements will be higher for the b-terms than for the a-terms. In literal or analogous statements this imbalance is not as strongly evident.

11. To create metaphoricity by viewing two objects as similar,

the high salient attributes of the vehicle have to be applicable as low salient attributes to the topic. This claim does not exclude the existence of high salient attributes of the vehicle which cannot be applied to the topic at all.

12. The salience of the intersection of A and B "is dependent on the salience values of matching elements in B, rather than on some function of the values in both A and B or of their values in A alone" (Ortony, 1979, p.164).

13. Salience imbalance causes semantic asymmetry and, at least in part, asymmetry of similarity.

## Review of Recent Literature on Children's Production and Comprehension of Metaphors

This section of the chapter contains a brief historical review of studies on children's metaphorical ability and on the formalist and functional views of metaphors in children's language. Also, children's spontaneous production of metaphors, and developmental stages of their metaphor comprehension ability are discussed.

### Changing Views on the Nature of Children's Metaphoric Language

For many years, it was a broadly shared tenet among researchers that children's metaphorical ability develops gradually and late (Inhelder & Piaget, 1958; Asch & Nerlove, 1960; Kogan, 1975;

Gardner, Kircher, Winner, & Perkins, 1975). Children were found to perform poorly in matching sentences with metaphorically related pictures and at choosing appropriate metaphorical completions for sentences. However, this dominant position has changed during the 70-s when researchers began to investigate the spontaneous speech act (Chukovsky, 1968; Bloom, 1973; Thomson & Chapmen, 1975; Bowerman, 1976; Winner, 1979). They found that children produced metaphorical instances at the very early age of two or three. The arguments following these observations seem to be that children use metaphors "inadvertently" (Pollio, 1980, p.311). This later concept means that children say something which "sounds" metaphorical because they are not aware of linguistic constraints present in words or their vocabulary development is inadequate. Children also might use metaphors unintentionally when they "play" with language or are just "joking". The lack of knowledge of the "proper" lexical items or syntax also can result in unexpected metaphorical communications.

## The Formal and Functional Views

The problem of childrens' metaphoric usage, according to Pollio (1980, p.312), can best be analyzed in terms of a distinction between formal and functional views of the metaphor. Those who hold the formal view believe that the metaphor is a purposeful deviation from the literal usage of language which demands full control over the knowledge, understanding and all the characteristics of the meaning of the literal form as well as the ramifications of metaphoric usage. Since cognitive and epistomological factors prevent children from fully meeting these demands, formalists have the tendency to view childrens' language as "incomplete" or "underdeveloped" adult language.

The functional view of metaphors addresses itself to the purpose or function of the usage of figurative utterances by the speaker. It considers metaphors as valid if they serve a definite purpose at a "reflected" or "unreflected" level (Pollio & Pickens, 1980, p.312). Metaphors might have many different purposes or functions including the enhancing of vocabulary, intellectual history, heuristic, masking, ornamental or verbal shorthand functions. The criteria for the functional viewpoint for accepting a metaphorical utterance is its quality of commnicating meaningfully.

Based on this theoretical ground, Billow (1977b) designed an experiment to study children's spontaneous figurative production. He analyzed young childrens' figurative utterances (between the age of 2.7 to 8.0) who were engaged in free play. He found that figurative verbalization was evident with high frequency at early ages of children and it peaked in three-year olds. The figurative use of language among the subjects was frequent until the children were six years old and above this age level it started to decline. Summarizing the findings, it is noted that figurative production shows a decreasing trend from preschool to elementary grades. The results support the functional view of metaphoric production among children as young as three because they can and do produce figurative meanings spontaneously or upon request. Their level of production even surpassed that of the level achieved by older children (Billow, 1977b; Gardner et all., 1975). It seems that the spontaneous production of figures of speech gradually decreases during the elementary school years (Gardner, Kircher, Winner & Perkins, 1975, Billow, 1977b) and increases again in adolescence (Schonberg, 1974).

An endorsement of the concept of the Piagetian developmental levels comes from Arlin's paper which suggests, in harmony with the above findings, that there seems to be a differential ability among children to produce, comprehend, and explicate different types of metaphors according to these levels. There is a noticeable qualitative change which occurs between the ages of 11 and 12 where children shift from concrete to formal operational thinking, a clear Piagetian prediction.

Studies of Billow (1977b) and Gardner et al. (1975) seem to suggest that children between the ages of three and seven divide language into two categories: strange and ordinary. They use strange (metaphoric) language quite frequently.

Another study by Pollio (1973) and Pollio and Pollio,(1974) was conducted to investigate the use of figurative language among children in grades three to six from varying socioeconomic backgrounds. The authors concluded that children use figurative language as early as grade three. But they also found that the nature and the actual setting of the task affected their figurative language production which was reflected in general developmental trends. Children on a non-school related task showed a regular increase with grade in the production of figurative language. On the other hand, children produced fewer total figures of speech or novel metaphorical statements on a school related task when the results were compared on a gradual or successive grade to grade basis. The explanation for this phenomenon probably lies with children's hesitancy or reluctance to use unusual figurative language which might jeopardize, by taking "risks", their academic advancement measured in "marks". When Schonberg (1974) investigated the figurative content of written works of high school students, she found that subjective tasks produced more figurative instances than did objective tasks. These and other results led Pickens and Pollio (1979) to believe that "figurative language competence may not be a unitary process but one that is strongly effected by specific task and situational constraints" (Pollio, 1980, p.318). Assuming that these conclusions are correct, it becomes necessary to view figurative competencies both developmentally as well as on an individual basis within the same population. On the topic of whether production rates of metaphors are a function of developmental levels or simply demands of the classroom, Pollio (1980) has presented interesting findings. His data indicated that high school students, on a composition task, produced more figurative communication than on comparisons or multiple sentence tasks. And compositions are clearly considered as classroom activities.

## Children's Metaphoric Competence

There is a growing pool of data which supports the assumption that children do have a structure of metaphoric competence. Gentner's (1977a, b) two early studies have demonstrated that preschool children possess basic metaphoric competence and they are able to map systems of relationships consistantly from base domain to target domain. In many cases these early metaphors are based primarily on "perceptual attribute overlap" (Gentner, 1984, p.20) that is comparing, for instance, the moon to a banana. But as children grow older, they use more relational metaphors.

Many recent studies completed in the area of children's metaphoric competence, have successfully avoided old confounding factors in research by providing children with a more naturalistic context for metaphors and by requesting them to act out or point out their responses as opposed to verbal paraphrasing (Dent & Ledbetter, 1983; Vasniado & Ortony, 1983; Winner, 1983). All these studies have demonstrated an early presence of metaphoric ability and competence in children.

The structure of this metaphoric competence shows a differentiation from early to higher grades. At an early developmental level, children demonstrate a global, general ability to handle figurative tasks which later changes to a set of highly differentiated competencies which make them capable of handling each task of metaphoric processing as an independent, unrelated entity. "Data of a developmental study suggests that development proceeds from general to specific" (Pollio, 1980, p.337). The theoretical basis for this assumption comes from Werner (1957, p.126) who stated that "whenever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration". Children's metaphoric competence and processing certainly fits this description.

## Children's Comprehension of Figurative Language and its Assesment

Besides metaphoric competence, the principal issue of comprehension and explication of metaphoric elements in communications by children calls for attention. The fact that a child can comprehend figurative language means that he or she is able to understand the meaning of figurative utterances and is able to demonstrate his or her understanding to other people. But what is the definition of the concept of "understanding"? Some researchers define it in terms of paraphrasing or multiple-choice selection while others view it as an explanation of metaphors. Both the paraphrasing and explanation of a metaphor, however, tax the child's cognitive abilities by requiring something more from him ~~or her~~ than simple comprehension. They demand the ability to abstract along with the rephrasing of or talking about the metaphorical utterance. It is very probable that the child understood the metaphor but he or she didn't have the ability to demonstrate his or her understanding to an observer in a required manner. Consequently, the logical question emerges: How should we assess children's comprehension"?

Pollio and Pickens (1980, p.315) recommend a three step procedure according to the difficulty of the text. In the first stage, the child should be given a multiple-choice test, a task which would demonstrate most directly his or her comprehension level of figurative language. The child would be required only to recognize figurative speech and choose the appropriate paraphrase of it from a list. A more difficult second stage for assessing children's metaphoric comprehension requires them to paraphrase figurative expressions. Here children would use their own language to rephrase the stimuli. During the third, explication stage, children would be required to abstract and discuss the inherent relationship of domains in figurative phrases, a most difficult task indeed.

To investigate children's comprehension of figurative language at different age levels, Winner, Rosenstiel and Gardner (1976) presented a multiple-choice task to children of six, seven, eight, 10, and 14 years of age. The results of this study showed differences among ages for explaining the meanings of short metaphorical sentences. It was found that metaphoric responses were more common among older subjects than younger children. The tendency towards giving metaphorical explications below the age 8 level was very low. These findings suggest a "sequence of steps that children go through on their way to true metaphoric comprehension" (Pollio & Pickens, p.316).

Studies done in the area of metaphoric comprehension and explication enhanced the beliefs among researchers that children's comprehension and explication abilities develop in an incremental way. They first recognize the correct paraphrases of figurative stimuli (Pollio & Pollio, 1979). This stage is followed by a higher developmental level where they are able to paraphrase figurative meanings on their own (Cometa & Eson, 1978). Finally, studies by Asch & Nerlove (1960), Billow (1975), Winner, et al. (1976), and Cometa & Eson (1978) revealed that children are successful in the task of explication of paraphrases of metaphors at older ages. However, these explications are not homogeneous in nature. Children of six or seven years of age, for instance, offered thematic explanations while the eight year olds' responses were more of a concrete type (Winner, at al., 1976). Children's ability to explicate figurative speech in a manner acceptable to adults seems to increase after the age of eight because different types of metaphors are understood at different ages. Novel and frozen metaphors are viewed as functionally equivalent by young children. Children's ability to comprehend both novel and frozen metaphors increases with grade, but from grade six onwards, they seem to understand frozen metaphors more easily than novel ones.

From the previous quoted studies on children's metaphorical processing, it is evident that even preschool children have metaphoric abilities. But, the acknowledgement of metaphoric competence alone answers only a few questions about children's comprehension of figurative language and doesn't account for the developmental progression. Gentner (1984) took a different approach to this complex problem by asking developmental questions about better "mapping strategies" (p.71) for analogies between different objects, about young children's abilities to recognize relational information between peculiar domains, and about their failure to demonstrate relational mappings between terms of metaphors. In this experiment three groups of subjects were used. Two groups were children (five to six and nine to 10 years of age) and the members of the third group were college students. The subjects, who came from middle class families were presented with three types of metaphors ("attribute metaphors", "relation metaphors", and "double metaphors") each type having eight instances. The first task was to describe separate objects which later appeared in a randomized order in the metaphor as topic or vehicle. After the completion of this task, the adult subjects were asked to write out interpretations of metaphors, and to rate their aptness and metaphoricity on a scale. Children's responses were elicited orally in all tasks. They described objects, interpreted metaphors by responding to graded questions by the examiners and rated aptness by pointing to pictures. This study suggests that "acquisition of both local domain knowledge and knowledge of the rules of mapping contribute to the developmental sequence" (Gentner, 1984, p.22). The overall developmental picture reflects the fact that children possess the ability to "map similar relational systems between different domains" and it is "present early in language development" (p.22). In order to comprehend complex metaphors, children also have to learn conversational rules of figurative language, rules of aesthetic use, physical relations and abstract systems before they can analogize about them.

Another intriguing issue concerning children's comprehension of figurative language is the discrepancy or paradox between their ability to produce metaphors and the not yet fully developed state of their metalinguistic skills (an ability to perform operations on language itself). In other words, the contradiction lurks somewhere between their ability to produce metaphors and their inability to understand them. Ortony's account of nonliteral similarity seems to solve this paradox by declaring that "preschool children who are apparently producing metaphors are instead producing statements based on underlying literal similarities from their perspectives" (1979, p.177). Children at an early age, when their schemata and metalinguistic awareness is not fully developed, find objects of comparison literally similar because of the existing high salience among the terms. At this stage of development, children tend to focus on the more concrete, more salient features of objects or situations. They have less internal representations of objects than adults have and these representations are less differentiated in terms of salience. Their perception of phenomena, consequently, will be different from that of adults. But in later years, the child's schemata gradually extends and he or she will be able to produce "cognitively" nonliteral similarity statements by choosing matching attributes high in salience for the b-term and low in salience for the a-term.

Children may see a given similarity statement as literal while adults will see it as metaphorical. This is possible because the child views the matching attributes as important for both terms whereas for adults "the matching attributes appear to satisfy the criterion for metaphorical similarity" (Ortony, 1980, p.26). With their limited vocabulary, children attempt to capitalize on their perception of high literal similarity. This view of perception of similarity, however, will gradually change as they acquire more knowledge.

## Limiting Factors in Children's Metaphor Comprehension

The current line of research (Readence, Baldwin, Martin and O'Brien 1984; Gentner, 1984) indicates that lack of knowledge of the domains of metaphors hampers children's figurative abilities. The knowledge and arrangement of attributes in the topic and the vehicle are the crucial factors which determine the nature of metaphorical interpretation. For instance, consider once more the previously mentioned metaphor "The souls are cellars". Without the knowledge of an agrono-economical model of traditional grape growing and wine producing, which is a major commercial and cultural factor historically in Austria, France, Germany, Hungary, Italy etc. where many rural households still possess specially built wine-cellars, the comprehension of the "souls of cellars" will be constrained for a child of the Northern climate of Canada. The source of limitation is the children's lack of knowledge of related schemata or cellar-attributes applicable to the "souls". This is the reason why children don't show "relational focus" (Gentner, 1984, p.22) or a strong tendency to produce relational interpretations (relational metaphors). After five years of age as children acquire an increasing amount of knowledge of domains' there will be a developmental increase in relationality.

Another factor limiting children's performance in metaphor comprehension is their perceived or assumed "task pragmatics" (Gentner, 1984). Children often believe that their literal knowledge of word meanings is requested, so their response to a metaphorical statement will be literal even though they are capable of responding figuratively. Readence et al.(1984), therefore, are critical of current instructional practices which they label as "atheoretical" because they fail to include the teaching of knowledge of the topic and vehicle attributes along with teaching of the necessary rules or psychological processes that permit the interpretation of metaphors.

## Summary

Historically, metaphor has been considered from a wider range of viewpoints and even today, there are several competing theories regarding the operation of metaphors. One of the most comprehensive of these theories is Ortony's Salience Imbalance theory in which semantic features and their similarity play a crucial role in explaining the metaphor comprehension process. The shared features or attributes are dependent on the context and viewed as highly salient for the vehicle and low salient for the topic. This inequality in salience of attributes is called salience imbalance and is indispensable for metaphor comprehension. The theory also postulates that when the terms of a metaphor are reversed, they cannot be interpreted meaningfully. This condition is viewed as asymmetric and is the result of imbalance in salience levels of the shared attribute for the vehicle and for the topic.

Research on children's use and comprehension of metaphors reveals that children use figurative language as early as grade three and there is an early presence of metaphoric ability during the preschool years. Children's ability to comprehend metaphors develops in an incremental way and it is strongly affected by specific task and situational constrains. Figurative competence, therefore, is viewed both developmentally and on an individual basis.

# Chapter III

# DESIGN OF THE STUDY

This chapter contains a description of subjects participating in the study and of the instruments including development, administration, and scoring. Also, the pilot study and its results will be presented. The description of procedures to analyse data centers around the comparisons made and the statistical methods used.

## Subjects

The children selected for this study were enrolled in the Edmonton Public School System. They attended four elementary schools in the West and South-West areas of the city. The schools serve an area populated by families living mainly in single family houses. Their socio-economic status could be characterized as middle or upper-middle class.

A total of 90 grade six students participated in this study and half of them were male and the other half were female. All subjects scored above the fiftieth percentile on the Edmonton Public School board Elementary Reading Test. This level of reading skills was chosen to ensure that lack of basic word identification and comprehension skills did not interfere with metaphor comprehension.

According to the selection criteria used for the study, 90 students were chosen from the total number of the grade six student population of 132 who were "qualified" to participate in the research project. The total number of grade six students in the four schools was 161. All the parents of the qualified children received a letter describing the objectives and the nature of the research along with a Consent Form. One hundred and one parents gave written permission which is 76.5 percent of the total number of "qualified" grade six students instructed in four schools. Subjects were randomly assigned to three groups, each containing 30 subjects with an equal number of boys and girls in each group. Random assignment was made to control for differences in background knowledge across subjects. The mean comprehension score on the Edmonton Public School Board Elementary Reading Test was 80.7 for Group 1, 81.9 for Group 2, and 81.0 for Group 3. Children who had repeated a grade, attended a special education class, or learned English as a Second Language were not selected for this project. The reading score, sex, and school of each subject in each treatment group are presented in Appendix A.

## Development of the Instrument

### Selecting Metaphors

The process for selecting appropriate metaphors for the stimuli was affected by specific criteria. Among them, children's language development was considered as an important factor. An effort was made to select metaphors which were not too difficult to comprehend and which contained familiar words in both the topic and the vehicle positions. Besides looking for words which were well established components of children's schemata at the grade six level, metaphors were sought which were also novel and "fresh". Another criterion was to search for metaphors from children's immediate experiences within their environment (school, home, friends, animals, weather etc.). It was believed that challenging, interesting, and inspiring metaphors would secure better participation, involvement, and general attitude toward the project.

As a possible source of such metaphors, Sound of a Distant Drum (Holt, Rinehart) for grade six students was examined. To the surprise of the researcher, the entire textbook contained only 36 metaphorical instances. This sum included all kinds of figurative phrases like similes, verb-metaphors, and personifications. This number shrank to 12 when only noun-metaphors, which were to be used in the study, were considered. Since these 12 metaphors did not meet the selection criteria, it was decided that another set of basal readers would be searched for suitable metaphors, namely Starting Points in Reading (Ginn). Unfortunately, this series yielded almost identical results as did the Holt reader. These results prompted a search in a new direction. Literature books written for 12 years olds were selected and read with the purpose of identifying as many metaphors as possible which would satisfy the selection criteria. These texts were found to be very rich in excellent metaphors, but the selection process was again hindered by the fact that these metaphors were very often remote from children's experiences. They contained strange or sophisticated vocabulary, and had complex structures. Inspite of their high quality, just a few were applicable and selected. Therefore, to expand the list, the researcher constructed additional metaphors which were based on children's and basal readers' vocabulary and which met the other selection criteria. A final list of ten metaphors was submitted to a panel of judges containing seven experts in the field to rate the suitability of these metaphors as stimuli. The six metaphors which obtained the highest scores were selected and these are listed below.

1. Recess is a whirlpool.
2. The weather is a roller-coaster.
3. The sailboat is a ballerina.
4. The smudge is a veil.
5. The hose is a boa-constrictor.
6. The notebook is a salad.

## Developing the Tasks

### Task 1

This task was developed to assess comprehension of metaphors in the ascending mode as compared to those in the descending mode, and to measure perceived goodness of each statement. A booklet of five pages containing 12 statements was produced. Six were in the ascending mode and six were in the descending (reversed) mode. Each metaphor was paired with its reversed version, but the order of the six consecutive pairs was varied randomly so the subjects would not be influenced in the measuring task by the order of the stimuli. Each booklet began with a brief description of the task, and this was followed by the list of 12 metaphors. After each metaphor, a blank space was provided for responses and a scale ranging from five to one was given. On this scale of "goodness", the ratings or units which ranged from five to one corresponded to "very good", "good", "average", "fair", and "poor". A copy of Task 1 is presented in Appendix B.

The subjects had two tasks in treatment group one. They were asked to paraphrase the meaning of each metaphor and to measure the goodness (meaningfulness) of these metaphors by ranking them on the scale which followed.

### Task 2

This task was developed to assess the impact of providing children with defining and characteristic attributes on metaphor comprehension. A booklet of 12 pages was developed containing the same six metaphors in the ascending mode as in task 1. Preceding each metaphor, two isolated words were presented. These were the topic and the vehicle of the following metaphor. Under each word, there was a list of 12 attributes of which six were "defining" and the other six were "characteristic" attributes of the topic word or the vehicle word respectively.

Each metaphor was followed by four blank lines reserved for the subjects' written paraphrase of the metaphor. Also, after the metaphor and the blank lines, the topic and the vehicle were printed again in the middle of the page. Six short blank lines numbered from one to six were presented after each word, and subjects were asked to select and write six attributes on these lines which they perceived as most salient to the word given. A copy of task 2 including directions is presented in Appendix B.

The tasks of the subjects were twofold. First, they were asked to paraphrase the metaphors after studying the list of attributes under the topic and the vehicle. Second, they were requested to select six words from the 12 attributes under the topic and the vehicle word which they thought were the most "important" (salient to or about them).

### Task 3

This task was developed to assess the impact of the shared attribute on metaphor comprehension. A booklet of five pages was prepared containing the same six metaphors in the ascending mode as on their two tasks. Under each metaphor, in brackets, a "helping word" was given to assist the subjects' comprehension of the metaphor. This helping word was actually the shared attribute between the topic and the vehicle. Each metaphor was followed by four blank lines to accommodate the subjects written paraphrase of the metaphor.

In the second part, the six metaphors along with their shared attributes were listed again. But this time, each metaphor with its shared attribute was accompanied by two questions and two scales. The questions asked how important the shared attribute was to the topic and to the vehicle respectively. Each question was followed by a scale of five ranging from "very important" to "not at all".

Question 1:

How important is "gracefulness" to the "ballerina"?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| not at all | little | average | important | very important |

Question # 2:

How important is "gracefulness" to the "sailboat"?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| not at all | little | average | important | very important |

The children were asked to indicate the "importance" of the shared attribute to the b-term on the scale by circling the appropriate number. A copy of task 3 is included in Appendix B.

The subjects had two tasks in this group. First, they were asked to paraphrase the metaphors when a shared attribute was given. Secondly, they were required to assess the salience (importance) of the shared attribute for the topic and the vehicle.

## Pilot Study

Many studies concerning comprehension of metaphors have indicated that the understanding of figurative language is closely related to and sensitive to knowledge. The selection of appropriate stimuli and administrative procedures, therefore, were crucial to this study. There were two purposes for conducting a pilot study in this regard.

1. It yielded information concerning the perceived difficulty level of the stimuli for the subjects.

2. By conducting a pilot study, the investigator had an opportunity to observe how subjects responded to instructions and to the wording of tasks, the actual time required to complete the tasks, and how children responded in general to the project.

Six students (three boys and three girls) were randomly selected from the sample population in one school ~~for the pilot~~ study. One boy and one girl were selected from each class because of slight differences in academic achievement levels among the classes. Two subjects were asked to complete each task. The elicitation of students' responses took place in an individual testing mode during the morning hours shortly after regular classroom instruction began. After a few comments were exchanged about general matters, the subjects were informed of reasons why this research project was being conducted and they were thanked for their participation. They were also reminded that their responses would not affect, in any way, their school marks. This was followed by the oral explanation of the task and the arrangement of test items in the stimuli was briefly shown. There was no need for any preliminary practice.

All the subjects clearly and immediately understood the oral explanation of the tasks. They did not ask any questions for clarification and only one student verbalized her understanding aloud so as to make sure that she understood it right. In spite of the investigator's encouragement to ask questions, only one student asked what to do if he didn't know the answer. The wording of tasks on the subjects' response sheets played a meager role in the entire process. After the oral instructions were given, they applied themselves at once to their task and did not spend much time, if any, on reading or studying the written instructions accompanying the metaphors.

The subjects' general response to the project was notably positive. They were cooperative, friendly, confident, and very task oriented. The speed at which they worked was commendable and they were still able to concentrate on the meanings of the metaphoric statements. From time to time, smiles, and different facial expressions crept onto their faces when they encountered a new and strangely worded expression. A boy loudly commented while reading "the notebook is a salad" that "it is strange". Another asked "why are all the sentences short?" Again, others commented on the quality of the metaphors or labelled some "funny" or "nonsensical". After the completion of the task they told the investigator, for instance, that they took ballet lessons or collected figurative words and underlined them when they read. Their response to some unusual phrases was spontaneous laughter.

It was an important objective of the Pilot Study to assess the level of difficulty of the stimuli for the subjects. Based on the analysis of the students written and oral responses (they found the text "interesting" and "enjoyable" and listed the best liked metaphors), it can be stated that the stimuli were within their language development stage and cognitive processing skills. They did not find it too difficult or frustrating nor too easy either. One girl mentioned that she didn't know the meaning of "turbulent", for instance, but she learned it from the group of other words. Others brought up the fact that the "helping word" or the shared attribute assisted them often in their efforts to figure out what the sentence meant.

Subjects were also asked to indicate any attributes for which they did not have meanings. No word was identified, suggesting that the number of unknown attributes was probably negligible. Some responders even used attributes in their responses which the investigater expected would cause some cognitive confusion.

The time required to complete the task was different for each group. Task one, for instance, required between 12 and 15 minutes and task three only ten minutes to complete. Task two was the longest stimulus and required the lengthiest time to complete (26 minutes on average). When the shared attribute was given (task three), the subjects needed only one minute to understand, paraphrase and write down the meaning of each metaphor. The average time required to study the list of attributes, paraphrase the metaphor, and complete the selection activity in task two was five minutes per metaphor with minimal individual divergence and spread.

In the following paragraphs, an analysis of the subjects' responses to anomalous and nonliteral similarity statements will be documented for all treatment groups.

a. Task One

Nonliteral similarity statements (ascending mode) and anomalous or reversed nonliteral statements (descending mode) were presented to subjects in even numbers. In the ascending mode, there is a low salience level of shared attributes for the topic and a high salience level for the vehicle (a > b). In the descending mode, the perceived salience level of shared attributes is high for the topic and low for the vehicle (b < a). Nonliteral similarity statements were interpreted correctly in 41 percent of the cases. The mean "goodness" or "meaningfulness" score for metaphorical statements on a scale which measures responses from "poor" (1) to "very good" (5) was 2.83. The same score for anomalous (reversed) sentences was only 2.00. Since 50 percent of the stimuli were in the reversed form for theoretical reasons, a subject of interest was how children responded to anomalous statements as opposed to nonliterals. They perceived the difficulty level of the stimuli as challenging but neither too easy nor too difficult. The figurative statements corresponded to the children's language development level and, consequently, adjustment in terms of vocabulary, semantics, and grammatical structure was not necessary.

An interesting difference emerged in the way adults and children viewed "goodness" of the metaphors. Only one metaphor, "The weather is a roller coaster", received an identical score, and was ranked as the second best by both adults (panel of judges) and children. Two more metaphors, "The notebook is a salad" and "The sailboat is a ballerina", could be identified as evaluated similarly by both groups for these metaphors were ranked as third and fourth on a scale from six to one. The other half of the metaphoric stimuli showed significant discrepancies on being viewed as "good". Children, for instance, chose "The hose is a boa-constrictor" as their favorite metaphor, but this was ranked by adults only as fourth. Adults, on the other hand, selected "The recess is a whirlpool" as their first choice because of the metaphoric quality of the turbulent, circling, whirling motion present in the vehicle which could fuse with the topic, giving a new, slightly different, and subtle meaning. Children had difficulty with this type of interpretation because they failed to recognize that the sentence is metaphoric. Consequently, their literal interpretation relied on their concrete knowledge of the domain of "recess". The same was evident in their evaluation of "The smudge is a veil" wherein children's cognitive dissonance was reflected by their "poor" rating, a sharp contrast to adults.

In summary, the subjects responded to all 12 similarity statements presented to them by paraphrasing their meanings. Based on the results of the pilot study, the same stimuli and procedures were used in the main study.

### b. Task Two.

Subjects' responses to the stimuli disclosed that 58 percent of the nonliteral similarity statements (metaphors) were correctly comprehended. This figure is significantly higher than the 41 percent for the first group, indicating that the added knowledge presented in the form of listed attributes to children played an ameliorating role in the metaphor comprehension process. The comprehension of "The smudge is a veil", for instance, was more successful by this group because they were exposed to a list of attributes as compared with the first group which yielded 100 percent incorrect responses on the same metaphor.

One half of the six metaphors presented were correctly comprehended by both subjects. The sailboat, for instance, was viewed by one subject as a ballerina" which "can do all sorts of neat things" and displays "gracefulness". Generally speaking, subjects in this group found the stimuli interesting and the difficulty level neither too easy nor too frustrating. An element of challenge was noticeable indicating that the subjects' language development and cognitive processing skills were adequate to the task.

The role that defining attributes play in the children's metaphor comprehension process was of major interest in this study. The subjects selected 71 highly salient defining attributes which they believed were the most important or significant features for the meaning of the topic and vehicle of the six metaphors. These (common) attributes represented 49 percent of the 144 defining attributes available for selection.

In the attribute selection task, the most salient and defining attribute of the vehicle was selected by the subjects in 50 percent of the nonliteral similarity statements. Selection of the most salient attribute (defining) occured 42 percent of the time for the topic. Also, in 25 percent of the metaphors, the children's selection of salient attributes for the topic and the vehicle included the most salient defining attribute for both terms.

In summary, subjects did not have any difficulty in understanding related oral and written instructions or wordings of tasks. They responded constructively to every item of the stimuli. Therefore, it was decided to follow the same procedure and use the same stimuli in the main study as in the pilot study. The time requirement for completion of the task was significantly lower than anticipated.

c. Task Three.

On this task, subjects received the same metaphors as the first and the second group did. But there was an important difference also in that the metaphors were accompanied by the shared attributes of the terms. The "gracefulness", for instance, triggered new associations and inferences required to view the "sailboat" metaphorically as a "ballerina". The results of the children's interpretation was that the "sailboat glided smoothly on the water". Another shared attribute "covering lightly", helped children to view the "smudge" as not dark "but very light" which "can be seen through". A guiding role for the ground in the process of obtaining nonliteral meaning was evident when one subject described the "notebook" as "very messy" after she read the shared attribute of "untidy condition". This supplied concept helped her to solve the cognitive dissonance between the topic and the vehicle and see the notebook as being "tossed like a salad"-an original hue to the meaning of the "notebook". Subjects in this group correctly interpreted 67 percent of all the metaphors. As it was found on the first and second tasks, the perceived difficulty level of the stimuli was well adjusted to the subjects cognitive and language development level. After analyzing the results of the pilot study, there was no need to change the semantic or grammatical substance of the stimuli or to change the wording of the instructions. The required time to complete the task was the shortest of all three groups.

In summary, the subjects were very cooperative and task oriented. They understood the oral and written instructions without difficulty. The stimuli presented to them were found to be "interesting", being neither too complicated nor banal and at their language and cognitive development level. The time needed to complete the task was significantly less than predicted. Subjects in the first group understood 50 percent of the metaphors. This number increased to 58 percent when attributes were given and culminated at 67 percent when the shared attributes were available to the subjects representing three different levels of understanding.

## Administration of the Instruments

Subjects were randomly assigned to three treatment groups as indicated above. Task 1 was administered to treatment group one, Task 2 to treatment group two, and Task 3 to treatment group three. All instruments were administered by the researcher in a room provided at the schools. The subjects were tested in small groups of tens. They received brief oral instructions and a demonstration concerning their tasks before they received the stimuli. At this point in time, they were encouraged to ask questions. Every subject in each group received the same stimuli and was asked to perform the same task. They completed tasks individually. Directions for administration are presented for each task in Appendix C.

## Scoring the Instruments

Comprehension is viewed in this study as a set of processes used by subjects to acquire information as a consequence of reading metaphorical sentences. Children's metaphor comprehension processes are characterized by their attempt and success to get meanings of metaphoric expressions by selecting and using one highly salient defining feature of the vehicle and applying it to the topic. This task, however, is difficult for young children and frequently leads to only limited success. Therefore, their metaphor comprehension was rated on a continuum wherein levels or degrees of comprehension were identified. A five point scale was adopted to measure comprehension ranging from unsuccessful responses (score 1) to perfect comprehension (score 5). The following criteria were used to identify and rate each response of all the subjects.

Value one was given when children did not respond to the stimulus because it "doesn't make sense"; they gave confused and nonsensical responses ("the hose is a type of boa-constrictor"); when they attempted to describe the topic by the vehicle using the words of "looks", "called" etc. ("the roller-coaster is called a weather" in "The weather is a roller-coaster"); they gave illogical answers ("there is a risk and it will help you in the end" for "The hose is a boa-constrictor"); or arguing about the stimulus without offering a meaning ("first, the weather is not proper punctuation or grammar. Second, what kind of weather?").

Value two was given to responses when children gave a literal interpretation of the metaphor or offered some speculations about its meaning but failed to view the topic and the vehicle as similar. For instance "The recess is a whirlpool" was interpreted as "at recess you go to a hottub" or "you go to the whirlpool on a special break". Similarly, "the ballerina dressed up as a sailboat at a ballet".

Those responses which revealed a viewed similarity of the domains (comparison) were granted the score of three . ("The whirlpool relaxes people and a recess is to rest"). In other cases, the similarity of the terms was recognized, but no attempt was made to elaborate on the new meaning of the sentence ("I think that a young child could be pretending that the hose is a boa-constrictor").

The value of four was given to those responses in which the subjects not only recognized the similarity relationship between the topic and the vehicle, but they were able to identify the shared attribute between the terms also ("The notebook has many layers as the salad has too"). These types of responses generally had the grammatical form of a simile by containing the word "like" ("The veil covers your face like a smudge covers an area" or "the hose is like a boa-constrictor because it is hollow").

When subjects were able to not only select a shared attribute but to transform the domains of the metaphor and to arrive at a new figurative meaning, level five was granted. This level represents full metaphoric comprehension. One subject, for instance, identified "large" and "thick" as the most salient attributes of the "boa-constrictor" ("The hose is a boa-constrictor") and applied these attributes to the hose to change its meaning. This new meaning is metaphorical because the hose is viewed through the boa-constrictor as "large and thick", which is significantly different from our conventional concept of a hose.

The subjects' total comprehension scores were obtained by adding up the scores assigned to each response (metaphor) during the evaluation process. The maximum obtainable score for a subject was 30.

The following scoring procedure was used for assigning saliency scores to the selected attributes under the topic and the vehicle in group two. The 12 attributes selected for the topic and the vehicle were chosen in such a way that six of them were defining attributes and six were characteristic attributes. The defining attributes received a score of one or two according to their salience value. These values were agreed upon and assigned to these attributes by a panel of judges who ranked the attributes according to their level of perceived salience. Half of the defining attributes received a value of two and half received a value of one. All the six characteristic attributes were assigned a zero salience score. Subjects were requested to select six attributes for the topic and six attributes for the vehicle in terms of importance (salience). Under optimal conditions six defining attributes would be selected for the a and b-terms because the similarity of the two terms of the metaphor is increased by the addition of every new defining feature. Each selected attribute by the subjects in both the topic and the vehicle list was assigned a score of "0", "1", or "2" according to the previously assigned value of that particular attribute. The maximum achievable score was nine for each term of the metaphor because if a subject selected six defining attributes three of them had an assigned value of "2" and the other three had an assigned value of "1" yielding a total score of nine.

## Analysis of Data

### Comparisons

In order to test the hypotheses outlined in Chapter I, the comparisons presented below were made.

Treatment Group 1

1. Compare scores on the measure of comprehension of metaphors in a paraphrasing task in the ascending mode with scores on the measure of comprehension of metaphors in the descending mode.

(hypothesis no.1)

2. Compare the measure of "goodness" scores obtained on metaphors in an evaluation task in the ascending and descending modes.

(hypothesis no.2)

3. Relate the measure of comprehension of metaphors in a paraphrasing task to the scores on "goodness" of metaphors in the ascending and descending modes of metaphors.

(hypothesis no.3)

Treatment Group 2

4. Compare the measure of comprehension of metaphors in a paraphrasing task when attributes are not given (treatment group one) with the measure of comprehension of metaphors in a paraphrasing task when 24 attributes (12 defining and 12 characteristic) are supplied.

(hypothesis no.4)

5. Relate the measure of comprehension of metaphors in a paraphrasing task when 24 attributes were given to the scores on salience levels of defining attributes for the topic which were selected by the students in the listing task.

(hypothesis no.5)

6. Relate the measure of comprehension of metaphors in a paraphrasing task to the scores on students' selection of defining attributes for the vehicle which were selected from a given list of 24 attributes.

(hypothesis no.5)

7. Relate the measure of comprehension of metaphors in a paraphrasing task to the number of characteristic attributes for the topic selected by the subjects in their listing task.

(hypothesis no.6)

8. Relate the measure of comprehension of metaphors in a paraphrasing task to the number of characteristic attributes for the vehicle selected by the subjects in their listing task.

(hypotheses no.6)

Treatment Group 3

9. Compare the measure of comprehension of metaphors in a paraphrasing task when shared attributes were given with treatment group one.

(hypothesis no.7)

10. Relate the measure of comprehension of metaphors in a paraphrasing task to the viewed level of salience (importance) of shared attributes for the b-term.

(hypothesis no.8)

11. Relate the measure of comprehension of metaphors in a

paraphrasing task to the viewed level of salience (importance) of shared attributes for the a-term.

(hypothesis no.8)

## Statistical Analysis

### T-test

When metaphors were reversed (descending mode), children's comprehension scores also changed because the high salient shared attribute for the vehicle was in the topic position and the salience imbalance was altered. It was important to know that the sample means in the ascending and the descending mode differed significantly from one another. If they did, it would mean that the change in salience level for both the topic and the vehicle and the change in the salience imbalance resulted in changes in children's comprehension of metaphors. Using the t-test as a test of statistical significance was justified here because both the comprehension and goodness scores formed an internal scale of measurement. By analyzing the data, it was also evident that the standard deviations were small relative to the means (see Table 1.1). Using the t-test was also justified because the differences in score variances were not too disparate.

### One-way Analysis of Variance

This inferential technique was used to determine whether sample means of different groups were significantly different from one another. The purpose for using analysis of variance with the above comparisons was to determine whether groups differing on specific independent variables (number of attributes, the presence of shared attributes) were significantly different on metaphor comprehension. The samples were comparable because each group contained an equal number of boys and girls, the subjects were randomly assigned to groups, the number of subjects in each group was equal, and the groups differed only on one critical (independent) variable.

Correlation

The advantage of using this statistical method lies with its ability to provide information about the degree of relationship between two variables investigated. This correlational method was used in this study wherein one independent variable (scores on goodness, defining attributes for the topic, defining attributes for the vehicle, characteristic attributes for the topic, characteristic attributes for the vehicle, shared attributes for the topic, and shared attributes for the vehicle) were correlated with the constant dependent variable (comprehension scores). Because the data were obtained from the subjects in the form of continuous scores (row scores), the use of correlation coefficients (r) with reading comprehension and salience data is reasonable. The correlation coefficient tells how large the relationship is between the given variables. For instance, if the r is around 0.8 for the comprehension and shared attribute scores but only 0.3 for the comprehension and defining scores, it can be concluded that children's scores on one variable (shared attributes) effectively predicts their scores on the other (comprehension). The strength of the relationship can also invite additional thinking and reflections about the nature of the relationship between the variables and the problem in general. However, it is recognized that the correlation coefficients cannot be used to infer cause-and-effect relationships.

### Chi-square

The Chi-square was used for post-hoc analysis in this study because the degree of relationship between the majority of variables was found to be very low. Since there was a significant difference between the means of comprehension scores in group one and two, and in groups one and three, it was deemed useful to investigate further the nature of the relationships between selected independent variables and metaphor comprehension. The Chi-square was chosen because it answered one major question, if there was a significant relationship between the row and the column variables. For the Chi-square analysis, the row variables were the instances of correct (set 1) and incorrect (set 2) responses. The column variables were the number of instances of selected higher salience scores for the vehicle (set + ) and for the topic (set -). Responses were judged as correct when they reflected metaphorical comprehension. The responses were judged as incorrect when the subjects failed to understand the metaphor, they interpreted it literally, or viewed it as simile. The column variables reflect the subjects' preferences in selecting salient attributes for the topic and the vehicle respectively.

## CHAPTER IV

## RESULTS OF THE STUDY AND DISCUSSION

The main objective of this chapter is to present and discuss the findings of the study. The chapter is organized around the eight hypotheses. For each hypothesis, the related descriptive statistics and the findings of statistical analysis are presented. These findings are then discussed in terms of whether or not they provide support for the salience imbalance theory, and a comparison is also made with the results of similar studies conducted by other researchers. The discussions under each hypothesis also contain elaborations on selected methaphors in a descriptive mode to help provide a more in-depth understanding of how children comprehend metaphors as they read.

### Research Hypothesis 1

#### Results

Based on the first research question, hypothesis 1 predicts that children's comprehension of metaphors will be significantly different in the ascending and descending modes. Results from Treatment Group 1 were used to test this hypothesis.

In the ascending mode, mean comprehension scores on the six metaphors ranged between 2.966 on metaphor 1 (M1) and 4.400 on metaphor 3 (M3). (In this chapter "M" will stand for "metaphor".) Comprehension scores ranged between one and five on each of the six metaphors (see Table 1.1). Standard deviations in the group of 30 subjects were found to be unequal for different metaphors, ranging from 1.003 for M2 to 1.608 for M4. As indicated in Table 4.1, the metaphors which had high mean comprehension scores were characterized by low standard deviations. When the mean comprehension scores were low, the standard deviations tended to be higher.

In the descending mode, mean comprehension scores varied between 2.433 on M1 and 3.333 for M6. The dispersion of scores in all metaphors, with the exception of M1 where the standard deviation was 1.040, was homogeneous with standard deviations between 1.269 and 1.388. With the exception of M1 and M6, there was a considerable evenness among comprehension scores at different values with only small fluctuations in percentages.

Comparing the descriptive statistics in the ascending and descending modes, some differences are apparent. The grand mean was 3.6 for the ascending mode and 2.848 for the descending mode. For metaphors of the ascending mode, the standard deviation is low when the mean is high. In the descending mode, the standard deviations are more closely grouped together, ie. more homogeneous.

A t-test for dependent means was performed on the comprehension scores to learn if there were any significant differences between the

Table 4.1

Comprehension Scores in the Ascending and the Descending Modes for Treatment Group 1

| | | Comprehension scores | | Frequency of values | | | | | Percentage of values | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | sd | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Ascending mode | M1 | 2.967 | 1.426 | 2 | 1 | 16 | 3 | 8 | 7 | 3 | 53 | 10 | 27 |
| | M2 | 4.400 | 1.003 | 1 | 2 | 1 | 7 | 19 | 3 | 7 | 3 | 23 | 63 |
| | M3 | 3.867 | 1.383 | 2 | 3 | 5 | 5 | 15 | 7 | 10 | 17 | 17 | 50 |
| | M4 | 3.033 | 1.608 | 7 | 3 | 7 | 4 | 9 | 23 | 10 | 23 | 13 | 30 |
| | M5 | 3.567 | 1.165 | 1 | 11 | 4 | 5 | 9 | 3 | 37 | 13 | 17 | 30 |
| | M6 | 3.767 | 1.455 | 4 | 2 | 3 | 8 | 13 | 13 | 7 | 10 | 27 | 43 |
| Descending mode | M1 | 2.433 | 1.040 | 5 | 4 | 14 | 7 | 0 | 17 | 13 | 47 | 23 | 0 |
| | M2 | 2.533 | 1.358 | 8 | 3 | 10 | 6 | 3 | 27 | 10 | 33 | 20 | 10 |
| | M3 | 3.267 | 1.388 | 4 | 5 | 6 | 8 | 7 | 13 | 17 | 20 | 27 | 23 |
| | M4 | 2.567 | 1.278 | 6 | 4 | 12 | 5 | 3 | 20 | 13 | 40 | 17 | 10 |
| | M5 | 2.900 | 1.373 | 7 | 8 | 4 | 7 | 4 | 23 | 27 | 13 | 23 | 13 |
| | M6 | 3.333 | 1.269 | 4 | 4 | 4 | 14 | 4 | 13 | 13 | 13 | 47 | 13 |

ascending and descending modes. The statistical analysis showed that there was a significant difference in the means between the ascending and the descending modes. (See Table 4.2). Subjects performed significantly better on metaphor comprehension on the ascending as compared to the descending mode.

Table 4.2

Summary of t-test for Comprehension Scores in Treatment Group One

| | Comprehension Mean | sd | df | t-value | p |
|---|---|---|---|---|---|
| Ascending | 3.600 | 0.780 | 29 | 6.84 | 0.000 |
| Descending | 2.838 | 0.815 | | | |

Figure 4.1 depicts differences between the ascending and descending modes for each of the metaphors. It is obvious that there was a greater difference between mean scores on some metaphors than on others. The metaphor for which the difference was most marked was M2. The "gracefulness" of the ballerina was a very salient attribute for all the subjects and it was universally part of their schemata. As a

result most of the subjects were successful at relating this feature to the topic in the ascending mode and arriving at a metaphorical interpretation. It seems that the presence of a "powerful" salient attribute for the topic not only enhanced the comprehension process in the ascending mode but also "discouraged" subjects from searching for alternative meanings. Because the gracefulness of the sailboat was so evident to the subjects, the visualization of the ballerina as a sailboat was not attempted with the same cognitive intensity. It was also apparent that metaphors in the ascending mode for which subjects did not have highly salient attributes received lower comprehension ratings.

In the ascending mode, the most frequent comprehension score for most metaphors was five. The following examples illustrate common types of subjects' responses.

M2 : The weather is a roller-coaster

Subject 2 :"The weather changes a lot, you don't know what will happen next".

Subject 23 :"The weather is good at one time and bad at another".

M3 : The sailboat is a ballerina".

Subject 9 :"The sailboat is very graceful above the water".

Subject 17 :"The sailboat is beautiful and graceful".

M4 : The smudge is a veil.

Subject 14 :"The mess is all over his/her face.

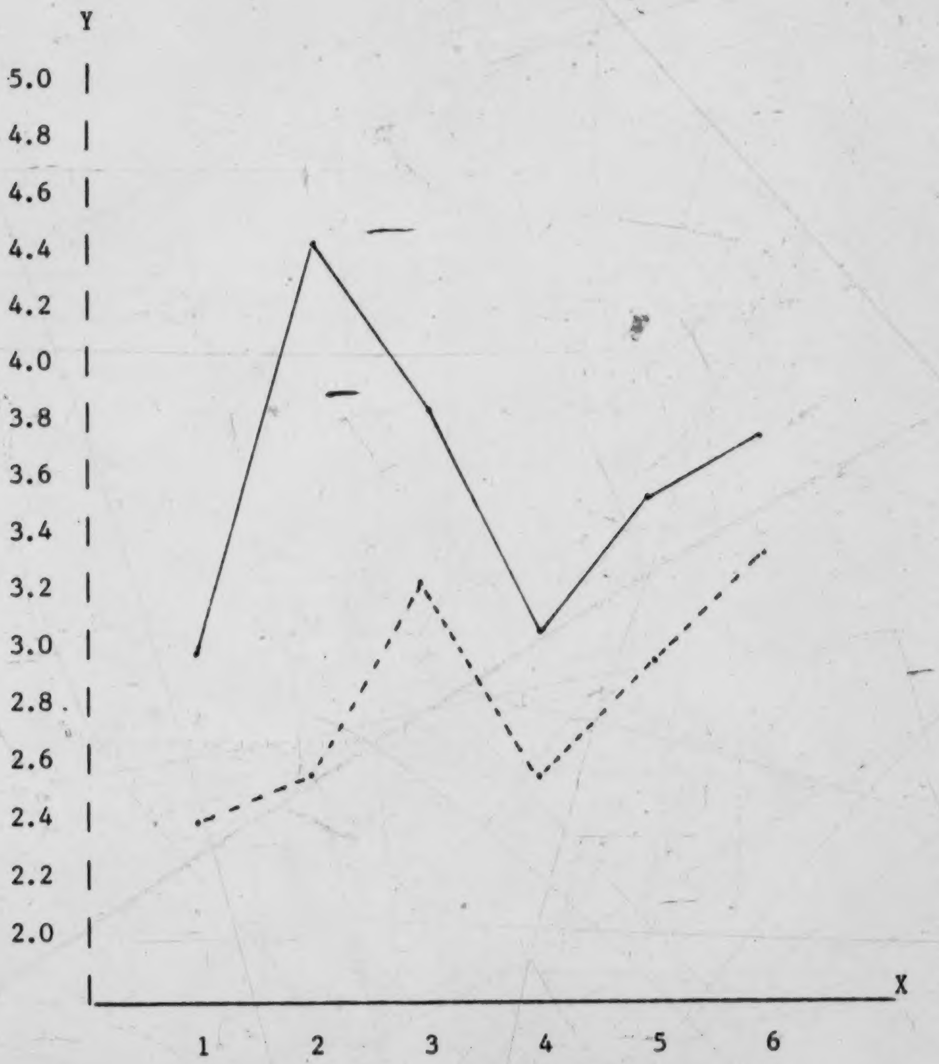

Figure 4.1 Comprehension Scores on Metaphors in Ascending and Descending Modes for Group 1

Note: Y: mean comprehension scores

X: metaphors

_____: ascending mode

-----: descending mode

Subject 29 :"The smudge is very tiny, detailed, precise etc.".

M6 : The notebook is a salad.

Subject 6 :"The notebook is very delicate, easy to ruin".

Subject 30 :"The notebook is in a mess".

For metaphor one the comprehension rating of two was most frequent.

M1 : The recess is a whirlpool.

Subject 13 :"I think it means that the recess is busy and mixed up".

Subject 20 :"Recess is fun".

For metaphor five, a comprehension rating of three occurred most frequently.

M5 : The hose is a boa-constrictor.

Subject 7 :"A garden hose with the head of a snake".

Subject 9 :"This has a possibility of meaning that something that is useful may also be dangerous".

In the descending mode, the subjects achieved a wider range in types of commonly occurring comprehension responses with less discrepancy across values. For M1, M2, and M4, the most common value was two.

M1 : The whirlpool is a recess.

Subject 12 :"I think it means a recess in a swirling pool of water".

Subject 14 :"The whirlpool is outside".

M2 : The roller-coaster is a weather.

Subject 5 :"It changes directions and bounces all over".

Subject 25 :"It goes so fast that it brings a strong wind".

M4 : The veil is a smudge.

Subject 3 :"The veil looked awful on the bride".

Subject 22 :"When you look at the lady from very far away her veil looks like a smudge".

The most frequent score for metaphors three and six was four.

M3 : The ballerina is a sailboat.

Subject 15 :"The ballerina is not very good".

Subject 26 :"The ballerinas emphasize themselves like a sailboat".

M6 : The salad is a notebook.

Subject 16 :"The salad is as hard as a notebook. It is good".

Subject 24 :"I'm not sure...The salad is made out of paper, or the salad looks crummy and unappetizing".

## Discussion

The results ~~of~~ the study support the prediction of the salience imbalance model that the measure of salience of attributes is affected by the order of the terms in the metaphor. If the sequence of the topic and the vehicle is reversed (descending mode), changes will result in the perceived similarity of these terms creating a lower level of understanding. The prediction of hypothesis one that children's comprehension of metaphors will be significantly higher in the ascending than the descending mode has been confirmed. Other researchers investigating metaphors have obtained results which are consistent with those reported here.

Ortony, et all., (1985) presented 62 undergraduate subjects with literal, metaphorical, and anomalous similarity statements in both ascending and descending (reversed) modes (Study 1). They were asked to perform a similarity rating task by deciding which of the two comparisons they thought seemed more "reasonable, sensible, and appropriate". A six-point scale was used to register their judgements. The researchers found that while all three types of similarity statements received reduced similarity ratings when their terms were reversed, the reduction for metaphorical similarity statements was substantially larger than for anomalous statements.

Readence, et al., (1984) investigated the validity of the Salience Imbalance Hypothesis by presenting 54 average or above average achievers in reading in grade six and 22 undergraduates with a list of 12 metaphors. The subjects were asked to write down what they thought about the meaning of 12 metaphors. The metaphors were randomly assigned to the list and the order of the topic and the vehicle was also randomly assigned. The authors found that grade six subjects interpreted metaphorical statements significantly more often in the ascending mode (low/high condition). In the descending (reversed) mode, the same subjects interpreted the sentences incorrectly significantly more often. Similarly, adults interpreted metaphorical sentences significantly more often when the ascending (low/high) condition resulted, and they interpreted the sentences incorrectly significantly more often in the reversed form. These findings of correlated relationships between the low/high condition (ascending mode) and metaphorical interpretations are consistent with the results of this study that children's comprehension of metaphors is enhanced in the ascending mode (low/high condition) and hindered in the descending mode (high/low condition).

The percentages of correct interpretations (scored five) were found much lower in all six metaphors in the descending mode than in the ascending mode. The subjects in their efforts to derive meaning from a metaphorical statement in an ascending mode frequently identified the most salient attribute of the vehicle, as was predicted by the theory of the salience imbalance model, and applied it to the topic. For instance, in "The smudge is a veil", "prettiness" was viewed in a subjective way as the most salient attribute of the vehicle yielding a new meaning for the topic which is "the smudge is very pretty". The concept of "pretty smudge" is definitely original and fresh, but idiosyncratic because most of the subjects viewed the "veil" with "gauzing" or "covering" qualities. In a similar way, the hose was visualized through a metaphorical fusion as "very long and fat" in "The hose is a boa-constrictor" or the weather which is "changing furiously" in "The weather is a roller coaster". What is common in these examples is that all of them were interpreted correctly in the ascending mode and misinterpreted in the descending mode as predicted by the salience imbalance model. However, a detailed analysis of the responses also revealed that some subjects responded differently to the stimuli, which has theoretical implications. The following "cognitive variations" were identified:

1. Different shared attributes were selected for the terms in

the ascending and the descending modes and although comprehension scores were higher on the ascending mode, meaning was obtained in both modes in spite of the prediction that the decreased salience level of the shared attribute for the topic would hinder the comprehension process. For instance, for the metaphoric interpretation of the sailboat, the subjects selected the adjective of "graceful" in "The sailboat is a ballerina", but for the interpretation of the "ballerina" the subjects selected the different adjectives of "very large or big" in "The ballerina is a sailboat". Similarly, for "notebook" the phrase "chewed by the dog" was selected in "The notebook is a salad" but for the "salad" the subjects selected the phrase "made of paper" in "The salad is a notebook". These examples indicate that the knowledge and arrangement of attributes for the topic and the vehicle was different for individuals and based on these schematical differences, interpretations of similarity statements in the descending mode was possible. In other words, salience imbalance was not the only prerequisite for metaphor comprehension.

2. There were also examples in which metaphorical statements were correctly interpreted in the descending but not in the ascending mode, another clear violation of the salience imbalance model's prediction. For instance, in the reversed descending statement "The salad is a notebook", the subjects found "being spread out" to be a highly salient feature for the topic which also could be applied to the notebook (vehicle).

These observations suggest that although salience imbalance is an inherent and significant feature of the metaphor comprehension process, subjects used a variety of strategies to obtain meaning for metaphorical statements. In this process, the structure of schemata for the terms of the metaphor in subjects long range memory played an important role.

## Research Hypothesis 2

### Results

Subjects in Group One evaluated the similarity of terms of metaphors in the ascending and descending modes by assigning "goodness" scores to each metaphor. The values of these scores obtained from each subject were between one and five. When children rated the overall goodness of a metaphor high, it was assumed that they perceived the topic and the vehicle as highly similar to each other. In this sense, the goodness scores are measures of similarity.

As can be seen in Table 4.3, the descriptive statistical data indicates lower means and more goodness scores of one and two in the descending mode as compared to the ascending mode. The grand means are 2.9 for the ascending mode and 2.2 for the descending mode. There is no noticeable difference in the size and pattern of the standard deviations in the two compared modes. Both are fairly homogeneous.

Similar to the analysis of comprehension scores for hypothesis one, a t-test for dependent means was performed on the "goodness"

Table 4.3

Goodness Scores in Ascending and Descending Modes
for Group 1

| | | Goodness scores | | Frequency of values | | | | | Percentage of values | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | sd | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| ascending | 1 | 2.933 | 1.048 | 2 | 9 | 10 | 7 | 2 | 7 | 30 | 35 | 23 | 7 |
| mode | 2 | 3.067 | 1.258 | 5 | 4 | 8 | 10 | 3 | 17 | 13 | 27 | 33 | 10 |
| | 3 | 3.600 | 1.070 | 2 | 2 | 7 | 14 | 5 | 7 | 7 | 23 | 47 | 17 |
| | 4 | 1.933 | 1.143 | 15 | 7 | 3 | 5 | 0 | 50 | 23 | 10 | 17 | 0 |
| | 5 | 3.367 | 1.273 | 2 | 6 | 9 | 5 | 8 | 7 | 20 | 30 | 17 | 27 |
| | 6 | 2.500 | 1.253 | 7 | 10 | 7 | 3 | 3 | 23 | 33 | 23 | 10 | 10 |
| descending | 1 | 1.966 | 1.149 | 14 | 7 | 3 | 5 | 0 | 48 | 24 | 10 | 17 | 0 |
| mode | 2 | 2.828 | 1.002 | 3 | 7 | 12 | 6 | 1 | 10 | 24 | 41 | 21 | 3 |
| | 3 | 1.759 | 1.154 | 18 | 4 | 4 | 2 | 1 | 62 | 14 | 14 | 7 | 3 |
| | 4 | 2.138 | 1.093 | 10 | 9 | 7 | 2 | 1 | 34 | 31 | 24 | 7 | 3 |
| | 5 | 2.966 | 1.210 | 3 | 8 | 9 | 5 | 4 | 10 | 28 | 31 | 17 | 14 |
| | 6 | 2.133 | 1.196 | 13 | 5 | 8 | 3 | 1 | 43 | 17 | 27 | 10 | 3 |

scores for ascending and descending modes. The purpose of the analysis was to learn whether there was a significant difference of means of goodness scores in the ascending and descending modes. The results of the analysis indicated that there was a significant difference between the grand means of the ascending and descending modes. Subjects obtained higher goodness ratings on metaphors in the ascending than decending mode. (See Table 4.4).

Table 4.4

Summary of t-tests of Comprehension Scores in Treatment Group Two

| | Goodness Scores | | | | |
|---|---|---|---|---|---|
| | Mean | sd | df | t | p |
| Ascending | 2.955 | 0.635 | 25 | -4.62 | 0.00 |
| Descending | 2.326 | 0.569 | | | |

## Discussion

The salience imbalance model predicts that there will be greater asymmetry between terms in metaphorical statements than in reversed statements. Goodness scores were used to measure similarity in this study as well as those conducted by other researchers.

Katz (1982) presented metaphors to a group of 25 university students and asked them to rate the goodness of the metaphors as part of a larger study. The metaphors were in the ascending and descending modes. Ratings on goodness scores were compared in the ascending and the descending modes and were found to be significantly different. Subjects perceived sentences as more metaphorical in the ascending mode than in the descending mode.

Ortony et al., (1985) in their "Study 3", presented 53 undergraduates with "Rating", "Preference", and "Meaningfulness" tasks to measure salience and test the Salience Imbalance Hypothesis. In the "meaningfulness" task the subjects were asked to indicate whether the ascending or descending order of comparisons were "meaningful" or "not meaningful". The dependent variable for an analysis of variance was the "proportion of subjects" assigning a "meaningful" response to each comparison. The factors were "Comparison Type" (metaphors or literal similarity statements) and "Term Order" (ascending mode and descending mode). A significant main effect for Comparison Type and Term Order was found. Also, there was a large difference between the proportions of comparisons rated as meaningful for ascending mode (.82) and for the descending modes (.44). These findings are consistent with the findings of the present study in that metaphors are asymmetrical and their meaningfulness decreases in the descending (reversed) mode.

It was hypothesized in this study that children would give higher scores for metaphors in the ascending order than for their reversed forms because the children would view the shared attribute as more salient for the vehicle than for the topic. For example, it was hypothesized that "gracefulness" would be more salient for the ballerina (vehicle) than for the sailboat (topic) in the metaphor "The sailboat is a ballerina". It was further hypothesized that in the reversed order ("The ballerina is a sailboat"), the shared attribute of "gracefulness" would be low in saliency for the vehicle (sailboat), and the similarity relationship between the ballerina and the sailboat would be significantly reduced. This metaphor (M3) was rated as "good" (four or five on the likert scale) in 76.6 percent of the cases. When it was reversed, only 10 percent of the subjects rated it as "good". In other words, children gave the reversed (descending mode) metaphors lower similarity ratings. The data on "goodness" ratings are very similar in M1 (70 and 16 percent). It seems that children viewed the shared attributes of M1 and M3 as very salient for the vehicle. Consequently, when the metaphor was presented in the descending mode, the similarity of the terms dropped significantly. In M1 "whirlpool" is more "turbulent" or "whirling" than "recess" just as predicted by the salience imbalance theory. But why is this difference not so obvious for the other metaphors? One reason can be found in the nature or quality of the metaphors involved. If the shared attribute is not high enough in salience level for the vehicle, it will allow for interpretations in both modes (ascending and descending) because there is more perceived similarity between the terms and less asymmetry or salience imbalance between them. It was as easy for the children to view the boa-constrictor as a hose as to view the hose as a boa-constrictor (M5).

A final observation may be made in regards to M4. This metaphor had almost identical mean goodness scores in the two modes. Since some subjects indicated that they had difficulty with the concept of "veil", it is suggested that children's word knowledge is an absolute "prerequisite" for a reliable assessment of their processing of metaphors and semantic similarities.

In summary, the analysis of data supported the prediction of hypothesis two that there would be a significant difference in goodness ratings between the ascending and the descending mode. Generally these results support the prediction that there is a greater asymmetry of similarity in metaphors than literal or anomalous similarity statements. However, while these statements are true overall, it is also recognized that the differences were not as great for some metaphors as for others.

## Research Hypothesis 3

### Results

The objective of this hypothesis was to further investigate and elaborate on the problem posed by the first research question concerning children's comprehension of metaphors. One aspect of their processing of nonliteral similarity statements in the ascending and the descending mode involves the relationship between comprehension scores obtained in the paraphrasing task and scores obtained on perceived similarity of the topic and the vehicle (goodness scores). The hypothesis states that there will be a significant positive relationship between the comprehension scores and the goodness scores.

To explore the relationship between metaphor comprehension scores and goodness scores (perceived similarity), the Pearson product moment correlation was used. One limitation of this method needs to be indicated however. Correlation coefficients are computed to provide a measure of the degree of relationship among many variables in an educational experiment. In this study, the correlational method was used to explore the degree of relationship between two variables (comprehension and goodness scores) for this hypothesis. This means that the complex phenomenon of metaphor comprehension was broken down into simpler components and it is acknowledged that many more variables interact during the metaphor comprehension process. The aim here was to investigate limited aspects of the process and prove or disprove selected predictions of the theory.

By analyzing the relationship between comprehension and goodness scores in the ascending mode (see Table 4.5), it was found that in only one-third of the metaphors (M1 and M6) was the relationship between the variables large enough to be significant. The results were very similar in the descending mode with slightly higher readings for the correlation coefficients and significant correlations for M1 and M3.

## Discussion

These findings only partially support hypothesis three because in two-thirds of the metaphors the similarity between the topic and the vehicle (goodness scores) did not significantly predict comprehension scores and even those correlations which were statistically significant were fairly low.

Table 4.5

Pearson Correlation Coefficients for Comprehension and Goodness Scores in Treatment Group 1

| goodness scores | comprehension scores | | | | | |
|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 |
| ascending mode | .321* | .163 | .089 | -.148 | .157 | .350** |
| descending mode | .337* | .055 | .445** | .039 | -.213 | .265 |

* significant at .05 level of confidence

** significant at .01 level of confidence

Questions immediately arise as to why there is a weak relationship between the variables? Why do two-thirds of the metaphors follow this pattern? The following conditions appeared to contribute to a tendency of subjects to assign lower level scores to goodness data and higher level scores for comprehension data.

1. Subjects arrived at metaphorical interpretations but they

failed to identify the most salient shared attribute for the vehicle. This was expected from them in their present stage of semantic development and language proficiency. For instance, viewing the sailboat as a floating object similar to the ballerina "floating" across the stage barely touching the surface of the floor in a smooth movement is an acceptable meaning. But this interpretation is idiosyncratic and the subject's own dissatisfaction with it was signalled by a low goodness score. Subjects failed to recall the most salient shared attribute ("gracefulness") from their semantic memory which would permit them to view the metaphor in a more "conventional", original, and striking way. As a result, the assigned lower goodness scores decreased the relationship between the variables expressed in correlation coefficients. However, as Borg (1983, p.623) stated, "relationship studies are aimed primarily at gaining a better understanding of the complex skills or behavior patterns being studied, and therefore low correlation coefficients are as meaningful as high coefficients".

2. This condition is different from the previous one in an important way. Subjects here were unable to view the new metaphorical meaning as the fusion of the topic and the vehicle. As a result, their interpretation took the grammatical form of a literal similarity statement ("is like") which the subjects themselves may have felt was unsatisfactory and consequently, their goodness rating was low.

3. Another idiosyncratic condition in rating is the general

tendency to score lower or "play safe". Subjects generally chose goodness scores from the middle levels of the scale.

4. Subjects also rated the metaphors on the basis of their likes or dislikes expressed towards the concepts of the topic or the vehicle and not on the overall metaphorical quality of the stimuli. For instance, "The recess is a whirlpool" was rated proportionally much higher in goodness than other metaphors in the stimuli because children just enjoy recess. Interestingly enough, this metaphor had the lowest means for comprehension scores in both the ascending and descending modes.

In summary, it can be concluded that a significant relationship was found between metaphor comprehension and goodness scores for one-third of the metaphors in each mode. The lack of statistical significance for the other metaphors can be explained by the above four conditions of metaphor processing. Because of the semantic complexity of metaphor comprehension, more comprehensive evidence for the theory was not found.

## Research Hypothesis 4

### Results

Comprehension scores for the six metaphors in treatment group two were obtained only in the ascending mode. Subjects in this group were presented with attributes for both the topic and vehicle before being asked to paraphrase the metaphors. Data obtained on the six metaphors are presented in Table 4.6.

Table 4.6

Comprehension Scores for Each Metaphor for Group 2

| | Comprehension Scores | | frequency of values | | | | | percentage of values | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | sd | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| M1 | 3.767 | 1.278 | 0 | 8 | 4 | 5 | 13 | 0 | 27 | 13 | 17 | 43 |
| M2 | 4.167 | 1.020 | 0 | 4 | 1 | 11 | 14 | 0 | 13 | 3 | 37 | 47 |
| M3 | 4.733 | .521 | 0 | 0 | 1 | 6 | 23 | 0 | 0 | 3 | 20 | 77 |
| M4 | 3.633 | 1.273 | 1 | 7 | 4 | 8 | 10 | 3 | 23 | 13 | 27 | 33 |
| M5 | 3.700 | 1.088 | 1 | 3 | 8 | 10 | 8 | 3 | 10 | 27 | 33 | 27 |
| M6 | 4.467 | .973 | 0 | 3 | 1 | 5 | 21 | 0 | 10 | 3 | 17 | 70 |

By comparing the standard deviation scores with the means, it becomes obvious that those metaphors which have the highest means have the lowest spread of scores. In comparing results of descriptive statistics between the comprehension scores in the ascending mode in treatment groups one and two, differences emerge. The level of means on every metaphor for subjects given attributes is higher than the means for subjects not given attributes. Correspondingly, the standard deviations are smaller for subjects given attributes.

In order to confirm or reject hypothesis 4 that there would be a significant difference in the measure of comprehension scores between the groups when children received a list of attributes and when they did not receive attributes, a one way analysis of variance was conducted. Means and variances were calculated for all three groups and these data are reported in Table 4.7. As a result of the test, a statistically significant F ratio was found for all three groups.

Table 4.7

Summary of Results of One-way Analysis of Variance on Comprehension Scores for Groups One, Two, and Three

| source of data | sum of squares | degrees of freedom | mean squares | F ratio | p |
|---|---|---|---|---|---|
| between groups | 8.3136 | 2 | 4.1568 | 10.5275 | 0.0001 |
| within groups | 34.3519 | 87 | 0.3948 | | |

The one-way analysis of variance, however, did not specify which of the means obtained from the comprehension scores of the treatment groups differs significantly from each other. Therefore to obtain this information, the Scheffe multiple range tests were used. As indicated in Table 4.8, it was found that the group pairs one and two and one and three were significantly different in their means at the 0.05 level. On the basis of these results, hypothesis 4 was accepted.

Table 4.8

Summary of Results of Scheffe tests for

Groups One, Two, and Three

| Group | Mean | sd | |
|---|---|---|---|
| 1 | 3.6000 | 0.7800 | |
| 2 | 4.0778 | 0.5702 | * |
| 3 | 4.3333 | 0.5010 | * |

(*) Denotes pairs of groups significantly different at the 0.05 level

## Discussion

One major purpose of this study was to investigate the role of knowledge in children's comprehension of metaphors. Our environment is viewed as a intricate and complex "structure" which is composed of meanings of the objects surrounding us. The components of these structures are called attributes. These building elements of lexical items convey meaning, and therefore, they are viewed as semantic attributes. Children understood M3 very well while their comprehension for M4 was very poor. It was possible to register such differences in comprehension because children's knowledge of the concepts of these metaphors was different and based on the extent of their schemata. Since the constituents or elements of this schemata are semantic attributes, it is theoretically sound to ask research questions concerning the role of semantic attributes or features in children's comprehension of metaphors. It was assumed that by receiving 24 additional attributes, children would comprehend metaphors better because their schemata would be enlarged. Also, they would be in a better "semantic position" to select shared attributes from a larger pool of features which would ultimately enhance comprehension. This prediction of hypothesis 4 was confirmed by the fact that there was a significant difference between the means of groups one and two. This finding underlines the importance of the number of attibutes available to children when they attempt to excogitate a new meaning for a similarity statement.

Based on these results, additional questions arise concerning the nature of the metaphor comprehension process. How do the additional attributes available to children affect their selection of attributes? Do they select and promote these attributes and if the answer is yes, to what extent? When the number of available attributes increases, does it affect all the metaphors evenly or are there further differences in the semantic structure of different metaphors which might result in different levels of comprehension among them? Is there any overlap in using the most salient attribute between treatment groups one and two?

In an attempt to answer these questions, only those metaphors were scrutinized which yielded correct interpretations by the groups. It is already evident from the descriptive statistics that the six metaphors showed a wide range of correct interpretations in both groups. Further analysis revealed that after receiving the 24 attributes, the children responded differently to particular metaphors. When the overall gain in comprehension between the first and the second group was compared, some metaphors received a higher number of correct interpretations than others. The increase was particularly dramatic on M6, M3, and M1 wherein it was 27, 24, and 16 percent respectively. Two metaphors, surprisingly enough, showed an actual decrease in the number of correct interpretations (three percent for M4 and 16 percent for M2) after receiving additional attributes. Metaphors six and two, which yielded the two most extreme results were further analyzed in terms of possible patterns in the selection of salient attributes.

In M6 the number and quality of attributes which accommodated a correct metaphorical interpretation was different for groups one and two. For instance, children in group one selected many original and idiosyncratic attributes by viewing the "notebook" metaphorically as "delicate", "cluttered", "crunchy", "chewed up", or "ugly". Only "messy" had a frequency which was greater than one. In contrast, the subjects of group two did not research their background memory for suitable and salient attributes. Instead, they relied extensively on the list of readily available attributes. The most popular was "messy" (8 occurrences), "untidy" (7), "torn" and "shreded" (6). These observations suggest that, on the one hand, children are able to select attributes from their memory and promote their salience level to accommodate metaphoric meanings. On the other hand, when a list of attibutes with a practical usability is handy, their selection of attributes will be heavily influenced and "guided" by this list.

In M2, where the presence of the list of attributes actually resulted in a decrease in the comprehension level, a different pattern emerged. The notion of "changing a lot" and "changing, bouncing rapidly" functioned as the most salient attributes for both "weather" and "roller-coaster". This feature was selected six and seven times respectively. Correspondingly, the frequency of selecting other attributes to accommodate meaning was also high and relatively even among attributes. It seems that children were able to rely on their well developed "weather" schemata and they did not have to depend on the "auxiliary list".

In summary, there were statistically significant differences in means between groups one and two. Although the increased number of semantic attributes resulted in higher comprehension scores, their impact on individual metaphors and on children's cognitive processing was varied. The availability of additional attributes accommodated well children's attempts to promote the salience level of these attributes but they seemed to "retrieve" less and "integrate" more.

## Research Hypothesis 5

### Results

It was the task of the subjects in Treatment Group Two to select six attributes from a list of 12 which were the most salient or defining for the topic. The same selection procedure was followed for the topic. The defining attributes received assigned "weights" according to their level of salience. The added weights of selected defining attributes for each metaphor ranged on a scale of scores between the values of one and nine.

The means for the defining scores for the topic show wide differences for the six metaphors as shown in Table 4.9. The same observation is valid for the standard deviations for the six metaphors. There is no obvious relationship between means and standard deviations. All the means of the defining scores for the vehicle in the six metaphors have at least a level of 4.000. As for the topic, an increase in the level of means does not correspond to a decrease in spread.

The comparison of data of the descriptive statistics for defining scores selected for the topic and the vehicle yields differences. The grand mean for defining attributes for the "topic" is 4.2166, but is 4.811 for the "vehicle". For the topic, the means

## Table 4.9

Summarised Scores on the Selection of "Defining" Attributes for the Topic and the Vehicle in Group 2

| | Defining scores | | frequency of scores | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | sd | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| topic | | | | | | | | | | | |
| M 1 | 4.100 | 1.447 | 0 | 2 | 9 | 11 | 4 | 2 | 0 | 2 | 0 |
| M 2 | 5.067 | 3.095 | 4 | 1 | 4 | 2 | 2 | 4 | 3 | 1 | 7 |
| M 3 | 5.333 | 1.493 | 0 | 1 | 4 | 3 | 6 | 8 | 8 | 0 | 0 |
| M 4 | 2.100 | 1.826 | 7 | 8 | 3 | 1 | 3 | 2 | 0 | 0 | 0 |
| M 5 | 5.333 | 1.709 | 0 | 1 | 0 | 5 | 10 | 6 | 4 | 3 | 0 |
| M 6 | 3.367 | 1.790 | 5 | 2 | 9 | 4 | 7 | 1 | 0 | 1 | 0 |
| vehicle | | | | | | | | | | | |
| M 1 | 4.833 | 1.510 | 0 | 2 | 2 | 9 | 10 | 2 | 3 | 2 | 0 |
| M 2 | 5.700 | 1.950 | 0 | 2 | 3 | 4 | 4 | 3 | 9 | 4 | 1 |
| M 3 | 5.433 | 1.942 | 0 | 2 | 4 | 3 | 7 | 5 | 3 | 5 | 1 |
| M 4 | 4.600 | 1.610 | 0 | 3 | 5 | 7 | 6 | 5 | 3 | 1 | 0 |
| M 5 | 4.167 | 1.763 | 1 | 3 | 9 | 5 | 7 | 1 | 2 | 2 | 0 |
| M 6 | 4.133 | 1.925 | 0 | 6 | 8 | 6 | 4 | 1 | 3 | 1 | 1 |

show a much wider spread and standard deviations than for the vehicle. The mean standard deviation of defining scores for the vehicle is also lower (1.783) as compared to the topic (1.893). The "compactness" of scores for the vehicle is also noticeable when the ranges and the frequencies of scores are compared between the topic and the vehicle.

To determine the significance of the relationship between comprehension scores and "defining" scores for the topic and the vehicle, Pearson's correlation coefficients were calculated for all metaphors combined and for each metaphor separately. There was not a significant degree of relationship found between the comprehension scores and defining scores for the topic nor between the comprehension scores and defining scores for the vehicle. (See Table

Table 4.10

Person Correlation Coefficients for Comprehension and Defining Scores in Treatment Group 2

| Defining scores | Comprehension scors | | | | | | |
|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | 6 | Combined Metaphors |
| Topic | .274 | -.091 | .118 | -.206 | -.111 | .096 | .061 |
| Vehicle | -.068 | -.216 | .186 | -.057 | -.152 | -.016 | .171 |

4.10). These findings do not support the prediction of Hypothesis 5 that there would be a significant positive relationship between the measure of comprehension scores and defining scores. On the other hand, there was a significant difference between the means of comprehension scores in treatment groups one and two indicating that the presence of the listed 12 attributes for the topic and the vehicle played an important role in achieving higher comprehension scores in group two. Therefore, in order to learn more about how the presence of defining features affected the reading comprehension scores on metaphors, a Chi-square test was performed on the data. The comprehension scores for 30 subjects in group two were divided into two sub-sets. In the first set, comprehension scores were identified and selected which had the value of five. These scores represent perfect metaphoric comprehension and was coded as type "1". All the remaining comprehension scores which had a value of four or less were placed in the second set (coded as type 2). These scores represent different levels of understanding of the metaphors, but do not represent metaphoric comprehension. In the next step, the defining scores for each subject on each metaphor in the "topic" and the "vehicle" set were compared. This was done by subtracting the defining score for the topic from the defining score for the vehicle for each metaphor. This yielded the difference between defining scores for the "vehicle" and the "topic". When the results were positive (coded as "+"), this indicated that the subjects achieved a higher salience level of defining scores for the vehicle than for the topic, support for the salience imbalance theory. When the results were negative (coded "-"), this indicated that the subjects achieved a higher salience level on defining scores for the topic than for the vehicle. For instance, if the defining scores were seven for the topic and five for the vehicle, the comparison score was -2.

As a result of the above comparison of defining scores, the Chi-square matrix had a dependent "row" variable (comprehension) and an independent column variable (defining scores). The row variable had two sub-sets coded as "1" and "2". The two sub-sets of the column variable were coded as "+" and "-". The subset "+" in row 1 represented the number of instances wherein correct comprehension scores (1) were matched with higher defining scores for the vehicle. The sub-set "-" in row 1 represented the number of instances wherein correct comprehension scores (1) were matched with higher defining scores for the topic. Under this circumstance, subjects understood the metaphor but selected more salient (defining) attributes for the topic than for the vehicle. The subset "1" represents the total number of correct comprehension scores and the subset "2" represents the total number of incorrect comprehension scores (see Table 4.11) for the six metaphors.

The results of the Chi-square test performed on the data for all six metaphors failed to show a significant relationship between the comprehension and defining scores as reported in Table 4.12. These findings lead to a comparison of the correct comprehension

Table 4.11

A Crosstabulation of Comprehension Scores by Defining Scores in the Six Metaphors

| Comprehension scores | Defining Scores + | Defining Scores - | Row Total |
|---|---|---|---|
| 1 | M1 : 7 | M1 : 6 | 13 |
| | M2 : 9 | M2 : 5 | 14 |
| | M3 : 14 | M3 : 9 | 23 |
| | M4 : 9 | M4 : 1 | 10 |
| | M5 : 3 | M5 : 5 | 8 |
| | M6 : 15 | M6 : 6 | 21 |
| 2 | M1 : 15 | M1 : 2 | 17 |
| | M2 : 7 | M2 : 9 | 16 |
| | M3 : 3 | M3 : 4 | 7 |
| | M4 : 18 | M4 : 2 | 20 |
| | M5 : 7 | M5 : 15 | 22 |
| | M6 : 5 | M6 : 4 | 9 |
| Column Total | M1 M2 M3 M4 M5 M6<br>22 16 17 27 10 20 | M1 M2 M3 M4 M5 M6<br>8 14 13 3 20 10 | 180 |

scores (set 1) with the defining scores (set +). The results yielded an overall score of 64 percent matching between the two variables. Hence, it was assumed that there would be a significant relationship between the correct comprehension scores (set 1) and the defining scores (set +) in some of the metaphors. Therefore, an additional Chi-square test was performed on two sub-sets of the data (see Table 4.13).

Table 4.12

Summary of Results of Chi-square Analysis on Comprehension and Defining Scores in Group 2

| Metaphor | Chi-square | df | significance |
|---|---|---|---|
| 1 | 2.8699 | 1 | 0.090 |
| 2 | 1.2651 | 1 | 0.260 |
| 3 | 0.1652 | 1 | 0.684 |
| 4 | 0.0 | 1 | 1.000 |
| 5 | 0.0 | 1 | 1.000 |
| 6 | 0.1785 | 1 | 0.672 |

In this set of data it was investigated if there was any significant relationship between children's correct comprehension of metaphors (set 1) and achieving higher saliency (defining) scores for the vehicle and lower saliency (defining) scores for the topic. The results indicated that the vaiables were significantly related in M4 and in M6, that is, for these metaphors children selected more defining features for the vehicle than for the topic. These findings partially support the prediction of Hypothesis 5.

Table 4.13

Summary of Results of Chi-square Analysis on Correct Comprehension Scores and Defining Scores in Group 2

| Metaphor | Chi-square | df | Significance |
|---|---|---|---|
| 1 | 0.077 | 1 | 0.782 |
| 2 | 1.143 | 1 | 0.285 |
| 3 | 1.087 | 1 | 0.297 |
| 4 | 6.400 | 1 | 0.011 |
| 5 | 0.500 | 1 | 0.480 |
| 6 | 3.857 | 1 | 0.050 |

## Discussion

From the results of the second Chi-square test, one question emerges. Why were the variables significantly related only in M4 and M6? A significant relationship between comprehension scores (set 1) and defining scores (set +) surfaced in those metaphors wherein the observed values in cell 1 and cell 2 were very different from the expected values for those cells. Consequently, the residuals were also very high. For instance, the observed values for cell 1 and cell 2 were nine and one in M4 and 15 and 16 in M6. The corresponding reading for M1 is only seven and six! When subjects selected defining features, they accommodated their comprehension in general. In "The notebook is a salad," the defining features of "torn pieces" or "shredded" were selected in all responses with perfect comprehension. This explains why M4 and M6 have variables that are significantly related but it does not explain why the other four metaphors don't. The answer to this question lies in the fact that the children frequently assigned highly salient defining features to the topic which did not participate "centrally" in the comprehension process as shared attributes. This practice resulted in "inflating" the total defining scores selected for the topic and the Chi-square reflected it as no relationship between the variables. Similarly, children frequently listed defining features for the topic which had lower (1) assigned salience values. These features did serve as shared attributes to assist the comprehension process but their "accumulated" values (scores) for the topic placed them into cell 2. The combined effect of the above conditions, therefore, resulted in a lack of significant relationship between variables for M1,2,3, and 5.

Children's selection of defining features for the topic and the vehicle during the metaphor comprehension process is very complex. "Irregularities" in processing were identified which were considered as diversions from the predicted patterns observed in M4 and M6. For instance, children selected more defining features for the vehicle than for the topic but they were not successful in obtaining a metaphorical meaning. This appeared to have happened for the following reasons: they stopped the processing of these features at the identification stage; they couldn't apply the defining features to the topic; they used a defining feature of the vehicle to "interpret" the metaphor while completely disregarding the presence of the topic; they selected defining features but did not use them in the comprehension process; or they gave false or even nonsensical elaborations. There were also significant idiosyncratic differences among children as they viewed, selected and applied defining features in order to obtain metaphoric comprehension.

In summary, when children selected more defining features for the vehicle than for the topic, their comprehension of metaphors was found to be also higher but these results were significant on only two of the metaphors. These results should be considered with caution because three statistical analyses were performed on the same data. Overall, these findings represent only partial support for Hypothesis 5 because the identification of the most salient defining features didn't necessarily result in spontaneous and immediate comprehension of metaphors. Children's cognitive strategies also played an important role.

## Research Hypothesis 6

### Results

The carriers of meaning are viewed by the salience imbalance model as semantic features. Certain features are not considered to be essential but only an incidental part of a word's meaning. They are called characteristic features. Based on the theory of salience imbalance, it was predicted by Hypothesis 6 that the comprehension of metaphors would be lower when children select characteristic features of words than when they select defining or essential features. Therefore, the actual numbers of characteristic attributes were analyzed statistically to learn what role they play in the comprehension process of metaphors. The highest number of characteristic attribute scores which could have been obtained from a list of defining and characteristic attributes was six. Consequently, the characteristic scores for subjects in group two had values ranging from six to one. They represented, for each subject, the number of instances when characteristic attributes were selected as most salient for the topic and the vehicle (see Table 4.14). The frequency of values obtained fluctuated from metaphor to metaphor. When the most salient attributes were selected by the subjects for the vehicle, the level of means for the characteristic attributes was low. It was noticeable that when the spread of data was low, the percentage of a particular single value was high. By comparing the data on characteristic scores selected for the topic and the vehicle, the following observations can be made. When the grand means are compared, they are found to be higher for the "topic" (3.222) than for the "vehicle" data (2.794). Hence, subjects more often selected

Table 4.14

Scores on the Selection of Characteristic Attributes for the Topic and the Vehicle in Group 2

| | ch. scores | | frequency of values | | | | | | percentage of values | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | sd | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 |
| topic | | | | | | | | | | | | | | |
| M1 | 3.267 | .944 | 2 | 2 | 14 | 10 | 2 | 0 | 7 | 7 | 47 | 33 | 7 | 0 |
| M2 | 2.500 | 1.996 | 4 | 5 | 3 | 5 | 4 | 2 | 13 | 17 | 10 | 17 | 13 | 7 |
| M3 | 2.400 | 1.102 | 7 | 10 | 8 | 4 | 1 | 0 | 23 | 33 | 27 | 13 | 3 | 0 |
| M4 | 4.700 | 1.022 | 0 | 0 | 6 | 3 | 15 | 6 | 0 | 0 | 20 | 10 | 50 | 20 |
| M5 | 2.700 | 1.119 | 3 | 11 | 11 | 3 | 1 | 1 | 10 | 37 | 37 | 10 | 3 | 3 |
| M6 | 3.767 | 1.006 | 1 | 1 | 9 | 13 | 5 | 1 | 3 | 3 | 30 | 43 | 17 | 3 |
| vehicle | | | | | | | | | | | | | | |
| M1 | 2.867 | .900 | 3 | 5 | 15 | 7 | 0 | 0 | 10 | 17 | 50 | 23 | 0 | 0 |
| M2 | 2.533 | 1.408 | 9 | 4 | 7 | 7 | 2 | 0 | 30 | 13 | 23 | 23 | 7 | 0 |
| M3 | 2.300 | 1.236 | 8 | 9 | 6 | 5 | 1 | 0 | 27 | 30 | 20 | 17 | 3 | 0 |
| M4 | 2.900 | 1.094 | 3 | 8 | 10 | 7 | 2 | 0 | 10 | 27 | 33 | 23 | 7 | 0 |
| M5 | 3.133 | 1.042 | 3 | 4 | 10 | 12 | 1 | 0 | 10 | 13 | 33 | 40 | 3 | 0 |
| M6 | 3.033 | 1.273 | 3 | 5 | 9 | 9 | 3 | 0 | 10 | 17 | 30 | 30 | 10 | 0 |

Note: ch = characteristic
M = metaphor

vehicle. It is also conspicuous that for the vehicle no subject was found who selected six characteristic attributes as the most salient. The corresponding figure for the topic is ten.

To learn about the relationship between children's comprehension of metaphors (dependent variable) and the frequency of their selection of characteristic features for the topic and the vehicle (independent variable), Pearson correlation coefficients were calculated (see Table 4.14). No significant relationships were found between comprehension scores and characteristic scores for either the vehicle or topic. However, it is important to note that there was a negative relationship between the variables for 50 percent of the metaphors. This slight tendency is in line with the prediction of Hypothesis 6 that when children comprehend metaphors they select less characteristic features for the vehicle. But based on the levels of significance obtained, it was concluded that the prediction of Hypothesis 6 was not supported by the findings.

Since it was believed that an investigation into a failure to find significant relationships where they were expected could be productive, a Chi-square test was performed on the data. Similar to Hypothesis 5, the comprehension scores were divided into two subsets coded as "set 1" and "set 2". (See "Results" section of Hypothesis 5 for a detailed description of how this was done). The two subsets of the independent variable were identified as "set +" and "set -". The former represents the number of selected characteristic attributes for the vehicle over the topic. "Set -" represents the number of

Table 4.15

Pearson Correlation Coefficients for Comprehension and Characteristic Scores in Treatment Group 2

| Characteristic scores for | comprehension scores 1 | 2 | 3 | 4 | 5 | 6 | combined |
|---|---|---|---|---|---|---|---|
| Topic | -.289 | .110 | -.108 | .257 | .121 | -.061 | -.036 |
| Vehicle | -.178 | -.160 | -.192 | .022 | .097 | .014 | -.248 |

characteristic attributes selected for the topic over the vehicle. It was assumed that when children comprehend metaphors, they select less characteristic features for the vehicle and more characteristic features for the topic. The results of the Chi-square test again failed to yield a significant negative relationship between these variables. However, an interesting phenomenon emerged. It was found that children selected more characteristic features for the topic than for the vehicle in M4 and M6. (It was three and seven for M4 and nine and 12 for M6.) The small residuals (1.5 and 2.0) didn't grant a significant relationship between the variables. These metaphors are the same in which the relationship between comprehension scores and the selection of defining features for the vehicle was significant. In other words, when children comprehended M4 and M6, they chose in absolute numbers more defining and less characteristic features for the vehicle and more characteristic and less defining features for the topic.

Table 4.16

Summary of Results of Chi-square Analysis on Comprehension Scores and Characteristic Scores in Group 2

| Metaphor | Chi-square | df | Significance |
|---|---|---|---|
| 1 | 2.3295 | 1 | 0.126 |
| 2 | 0.0102 | 1 | 0.919 |
| 3 | 0.0035 | 1 | 0.952 |
| 4 | 0.0000 | 1 | 1.000 |
| 5 | 0.8629 | 1 | 0.352 |
| 6 | 0.6349 | 1 | 0.425 |

## Discussion

After the statistical analyses failed to give evidence that there was a significant negative relationship between comprehension scores and the number of selected characteristic attributes, additional questions were raised about the role of these attributes in the metaphor comprehension process. Questions included the following: how can children comprehend metaphors with the "assistance" of characteristic attributes, is it possible that characteristic attributes might function in selected instances as shared attributes, and, can a specific characteristic attribute be very salient for a particular child? In order to answer these questions, all responses were analyzed wherein children selected more characteristic attributes for the vehicle than for the topic and when the comprehension scores were correct (subset 1). The results indicated that there wasn't a single instance where a characteristic attribute was promoted and functioned like a shared attribute. There wasn't any instance found where a child viewed a particular characteristic attribute as highly salient for the vehicle and it accommodated metaphoric comprehension. These observations support the prediction of the salience imbalance model that highly salient (defining) attributes for the vehicle accommodate metaphoric comprehension. It was also apparent that once a defining feature was selected as a shared attribute for both terms of the metaphor, the actual numbers of the characteristic attributes selected for either term were not important anymore. Probably this is the reason why the number of selected characteristic attributes fluctuated and was inconsistent among the metaphors.

In summary, the correlation statistics failed to yield any significant relationship between the total comprehension scores and the number of characteristic scores selected for the vehicle or the topic. A Chi-square test investigating the relationship between comprehension scores and the number of selected characteristic scores turned out to be insignificant also. Therefore, it can be stated that these findings failed to support the prediction of Hypothesis 6 that there will be a significant negative relationship between comprehension scores and the number of characteristic attributes selected. It seems that the lack of presence of characteristic scores for the vehicle and their simultaneous abundance for the topic doesn't "predict" metaphor comprehension and it can't be a precondition to it either. Rather comprehension of a metaphor hinges on the emergence of a highly salient attribute for the vehicle which can be applicable to the topic. The selection of this attribute, however, is highly idiosyncratic.

## Research Hypothesis 7

### Results

The subjects in group three completed the paraphrasing task on six metaphors which were accompanied by their shared attributes. The mean comprehension scores were calculated for each metaphor and these means were found to be very high for all six metaphors as can be seen in Table 4.17.

There is a visible pattern for the six metaphors; as the means of comprehension scores increase in level, the dispersion of scores decrease. There is a large difference in the descriptive comprehension data between groups one and three. The grand

Table 4.17

Comprehension Scores in the Ascending Mode in Group 3

| | Comprehension scores | | frequency of values | | | | | percentage of values | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | sd | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| M1 | 3.533 | 1.432 | 0 | 13 | 1 | 3 | 13 | 0 | 43 | 3 | 13 | 43 |
| M2 | 4.800 | .551 | 0 | 0 | 2 | 2 | 26 | 0 | 0 | 7 | 7 | 87 |
| M3 | 4.533 | 1.042 | 0 | 4 | 0 | 2 | 24 | 0 | 13 | 0 | 7 | 80 |
| M4 | 4.233 | 1.194 | 0 | 5 | 3 | 2 | 20 | 0 | 17 | 10 | 7 | 67 |
| M5 | 4.233 | 1.165 | 1 | 3 | 2 | 6 | 18 | 3 | 10 | 7 | 20 | 60 |
| M6 | 4.667 | .844 | 0 | 2 | 1 | 2 | 25 | 0 | 7 | 3 | 7 | 83 |

mean of comprehension scores for group one was 3.6 and the grand mean for group three was 4.333. As the results presented in Tables 4.7 and 4.8 on pages 162 and 163 show, subjects in group three performed significantly higher than those in group one. In group one, four metaphors had value five as the most frequently achieved comprehension score. In group three, on the other hand, value five was the most frequent comprehension score obtained for all six metaphors.

## Discussion

The salience imbalance theory predicts that the comprehension of a metaphor takes place when the reader (listener) succeeds in recognizing the condition of metaphoricity in a similarity statement and selects a shared attribute which is higher in salience level for the vehicle and lower in salience level for the topic. Therefore, the knowledge of a shared attribute which is applicable to both the topic and the vehicle is an important prerequisite for the comprehension of metaphors. Hence, hypothesis 7 postulates that the comprehension of metaphors will be higher in group three than group one because in the former, the availability of a highly salient shared attribute accommodates the comprehension process. This prediction of the theory has been proved correct because the means were found to be significantly different between group one and three. In the first group, subjects were much less successful in their attempt to obtain meaning for the metaphors than subjects in the third group. They experienced comprehension difficulties because they either lacked knowledge of the concept of the vehicle (for instance the "veil" in M4) or the extent of their vehicle schemata (in our example the "veil") was limited. In contrast, when shared attributes were given to the subjects in the third group, it seemed that the presence of a shared attribute helped to clarify the meaning of the vehicle. It also helped to trigger formerly less salient attributes of the veil schemata to emerge as salient attributes applicable to the topic (smudge).

The subjects produced a pool of different shared attributes for M4 in group one. Some of these attributes can be classified as "relational" attributes because they describe the "veil" as "beautiful" or "pretty" according to the subject's aesthetical taste and "semantic" emotions related to veil. Others can be classified as "functional" because they provide a major function of the veil, and still others can be classified as "perceptual" when subjects selected concrete, visible traits of the veil. (It is "fine", has "lace" or "holes" in it etc.). This third group was the most common for this metaphor. However, when a "functional" shared attribute was introduced to the subjects, the number of this "type" of shared attribute selected by the children soared in group three and became the most popular type of attribute. It seems that the presence of a shared attribute ("covering lightly") influenced and assisted the subjects in their effort to activate their schemata and select attributes which were related or similar to the presented shared attributes. It appears that once this "initial help" was given, students in general were able to select many highly salient attributes for the vehicle, like the veil covers "faintly", "transparently", "not noticeable" and view it as a salient property of the topic also. These observations are based on the analysis of the number and nature of the selected "relational", "functional", and "perceptual" shared attributes for the metaphors in both groups.

In summary, the analysis of data supported the prediction of hypothesis 7 that there would be a significant difference in the level of comprehension of metaphors when shared attributes were not given to subjects and when shared attributes were given to subjects. It seems that shared attributes contribute to the successful emergence and unfolding of "dormant" attributes which can be viewed as highly salient for the vehicle and as low salient for the topic, accommodating a metaphorical interpretation.

## Research Hypothesis 8

### Results

The subjects of treatment group three were asked to respond to the given shared attributes by evaluating their level of perceived salience in relation to the vehicle and the topic. The scale used had values ranging from five to one. As shown in Table 4.18, the spread of saliency scores in all six metaphors for the vehicle was low. When the levels of means increased, the corresponding spread of scores decreased for all six metaphors. For instance, the mean of 3.767 in metaphor six was associated with a standard deviation of 1.223 (a low-high correspondence), and the mean of 4.567 in metaphor five was associated with a standard deviation of .679 (a high-low comparison).

Subjects also evaluated the perceived saliency of shared attributes for the topic. The dispersion of the perceived saliency scores by all subjects for all six metaphors was relatively wide. With the exception of M6, the standard deviation calculated for each metaphor was surprisingly even between the 1.1 and 1.3 levels.

To explore the relationship between total comprehension scores

Table 4.18

Salience Scores on the Shared Attributes for the Topic and the Vehicle in Group 3

| | shared attribute scores | | frequency of values | | | | | percentage of values | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | sd | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| topic | | | | | | | | | | | | |
| M 1 | 2.467 | 1.137 | 8 | 6 | 11 | 4 | 1 | 27 | 20 | 37 | 13 | 3 |
| M 2 | 3.767 | 1.331 | 2 | 5 | 3 | 8 | 12 | 7 | 17 | 10 | 27 | 40 |
| M 3 | 3.433 | 1.251 | 3 | 4 | 6 | 11 | 6 | 10 | 13 | 20 | 37 | 20 |
| M 4 | 2.600 | 1.133 | 5 | 10 | 9 | 4 | 2 | 17 | 33 | 30 | 13 | 7 |
| M 5 | 3.933 | 1.363 | 3 | 3 | 1 | 9 | 14 | 10 | 10 | 3 | 30 | 47 |
| M 6 | 3.433 | 1.612 | 6 | 3 | 6 | 2 | 13 | 20 | 10 | 20 | 7 | 43 |
| vehicle | | | | | | | | | | | | |
| M 1 | 4.067 | .868 | 1 | 0 | 4 | 16 | 9 | 3 | 0 | 13 | 53 | 30 |
| M 2 | 4.167 | 1.020 | 1 | 1 | 4 | 10 | 14 | 3 | 3 | 13 | 33 | 47 |
| M 3 | 4.333 | .954 | 0 | 3 | 1 | 9 | 17 | 0 | 10 | 3 | 30 | 57 |
| M 4 | 3.800 | 1.064 | 1 | 3 | 5 | 13 | 8 | 3 | 10 | 17 | 43 | 27 |
| M 5 | 4.567 | .679 | 0 | 0 | 3 | 7 | 20 | 0 | 0 | 10 | 23 | 67 |
| M 6 | 3.767 | 1.223 | 3 | 1 | 5 | 12 | 9 | 10 | 3 | 17 | 40 | 30 |

and saliency scores for the vehicle and the topic and to prove or disprove hypothesis 8, the Pearson product moment correlation was used. It was found that in half of the metaphors (M1, M2, and M4), the relationship between comprehension scores and saliency scores for the vehicle was large enough to be significant (See Table 4.19). However, the degree of relationship between the total comprehension scores and the saliency scores for the topic was not found to be significant for any of the metaphors. Therefore, it was concluded that the findings of correlational statistics partially supported hypothesis eight that there would be a significant positive relationship between comprehenson scores and the saliency scores of

Table 4.19

Pearson Correlation Coefficients for Comprehension and Salience Scores of Shared Attributes in Group 3

| Salience scores | Comprehension scores | | | | | | |
|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 | combined metaphors |
| Vehicle | .230* | .306* | .057 | .472** | .132 | .256 | .273 |
| Topic | -.073 | .122 | -.104 | -.056 | .379 | -.118 | -.124 |

* significant at .05 level of confidence

** significant at .01 level of confidence shared attributes for the vehicle.

To further investigate how children's comprehension was affected by the perceived salience level of the shared attributes for the topic and vehicle, a Chi-square test was run on the data. From the total comprehension scores, two categories were created for the row variable ("set 1" and "set 2"). Also from the saliency scores, two categories were created for the column variable coded as "set +" and "set -". "Set +" indicates the number of cases where subjects with correct comprehension achieved a higher salience score for the vehicle than for the topic. "Set-" indicates the number of cases where subjects with correct comprehension achieved higher salience scores for the vehicle.A detailed description of this procedure has been outlined in Hypothesis 5, and therefore, it will not be repeated here again.

The Chi-square test was used to investigate if there was a significant relationship between correct comprehension scores and achieving higher saliency scores for the shared attribute in both terms of the metaphor. The results indicated that the variables were significantly related for M2, M3, M4, and M5. For M1, the test was abandoned because only one cell was generated. However, all 13 subjects in cell 1 viewed the shared attribute as more salient for the vehicle than for the topic, which supports the prediction of the theory. Therefore, it can be concluded that the results of the Chi-square test provide partial support for the prediction of Hypothesis 8.

Table 4.20

Summary of Results of Chi-square Analysis on Correct Comprehension Scores and Salience Scores of Shared Attributes in Group 3

| Metaphor | Chi-square | df | Significance |
|---|---|---|---|
| 1 | only one cell generated | | |
| 2 | 7.538 | 1 | 0.006 |
| 3 | 8.167 | 1 | 0.004 |
| 4 | 12.800 | 1 | 0.000 |
| 5 | 10.889 | 1 | 0.001 |
| 6 | 1.000 | 1 | 0.317 |

## Discussion

The salience imbalance theory explains metaphoricity by the uneven level of salience of the shared attribute for the topic and vehicle. The shared attribute is viewed as more salient for the vehicle than for the topic. Hence, Hypothesis 8 predicted that there would be a significant positive relationship between children's comprehension scores of metaphors and their ability to view the given shared attribute as more salient for the vehicle and less salient for the topic. It was assumed that children would select higher salience scores of the shared attribute for the vehicle than for the topic. For the chi-square, this would result in a higher cell entry in cell 1 than in cell 2 when metaphor comprehension was obtained. This was predicted because salience imbalance is a precondition to metaphor comprehension and all the comprehension scores in "set 1" were correct interpretations. The prediction of Hypothesis 8 was supported by four metaphors. For instance, for M4 children viewed the shared attribute as more salient for the vehicle than for the topic 18 times (cell 1) but only two times was the shared attribute more salient for the topic (cell 2). The residuals were also very high (seven or eight) indicating a large descrepency between cells. These findings support Hypothesis 8 and the predictions of the Salience Imbalance Theory.

By analyzing those responses in which children interpreted metaphors correctly but failed to rate the shared attribute as more salient for the vehicle, further speculations can be made. It seems that particular features and the subject's schemata played an important role in children's metaphor comprehension. When "untidy condition" was given to the subjects as a shared attribute, they seldom used the word directly in the comprehension process. Rather, they used some word similar in meaning (also highly salient for the vehicle) from their background memory. It seems that certain features like the "untidy condition" interacted with other sets of features ("dog-eared", "crumpled", "torn", "messy") to produce metaphoric meaning ("The book is dog-eared, torn, and crumpled"). Or, under different conditions, it "guided" the selection of additional features ("The notebook is very messy") because the "untidy condition" as shared attribute helped the subject to find an equally salient shared attribute for the vehicle. Since the given shared attribute seldom participated directly in the comprehension process, but served as a starting point for the search of a suitable shared attribute, it also can be speculated that adults' and children's schemata are very different. The extent of the schemata also explains why children viewed the "notebook" in "The notebook is a salad" as more important (salient) than the "salad" (vehicle). Their daily experience with a notebook is more extensive than with a salad. ("It (notebook) is very important because you can get graded on how neat your workbook is" one subject stated).

Another question emerges from the results: Why do children view the shared attribute as more salient for the vehicle but fail to understand the metaphor? One reason might be their lack of success in relating the shared attribute to the topic because of their insufficient topic-schemata. As a result, they do not know how to promote the salient shared attribute to the topic. A second reason can be identified as people's "natural tendency" to focus on the vehicle. As a result, cell entry 3 increased because subjects produced salient shared attributes but failed to comprehend the metaphor.

In summary, the Pearson product moment correlation revealed a significant relationship between comprehension and saliency scores for the vehicle in three metaphors, but failed to find any significant relationship between comprehension and saliency scores for the topic. A Chi-square test was conducted to further explore the relationship between correct comprehension scores and salience scores of the shared attributes for the vehicle and the topic. The results support the prediction of Hypothesis 8, although a note of caution must be made here concerning this finding because a post-hoc test was performed on the same data which might result in accumulated alpha errors. It seems that during the comprehension process certain features interact with other sets of features as to help readers find a highly salient shared attribute for the vehicle. Differences in adults' and children's schemata were noticed also.

# CHAPTER V

# SUMMARY, CONCLUSIONS, AND IMPLICATIONS

This chapter contains a brief summary of the study, the main conclusions, and implications for theory and practice. The chapter is concluded with recommendations for further research.

## Summary

The significance of metaphors for cognition lies with their ability to transfer understanding from what is well-known to what is less well-known. During the learning process, children use their existing knowledge to create new knowledge which results in a simultaneous change in their cognitive structure. The role of metaphor is to accommodate these changes in cognition and to aid in the generation of new knowledge.

The major purpose of this study was two-fold. First, it investigated the Salience Imbalance Model of metaphor processing as a useful instrument to explain children's comprehension of metaphors. This involved also the testing of selected predictions of the model. Second, the study aimed to expand the existing empirical knowledge about children's comprehension and processing of metaphors. The research questions were centered around children's comprehension of metaphors in the ascending and descending mode, the influence of an extended list of defining and characteristic attributes on metaphor comprehension, and finally, the role of readily available shared attributes of the metaphors in the comprehension process.

The concept of metaphor has been of interest to philosophers since the time of Aristotle. There have been many theories to account for metaphors including substitution, comparison, interaction, and transformation theories. While there are strengths and weaknesses of any theory, the Salience Imbalance Model of metaphors was selected as the theoretical framework for the present study because of its explanatory power and comprehensive nature. This model views the relationship between the topic and the vehicle of a metaphor as a similarity relationship dependent on the level of salience of the semantic features in these terms. Both the topic and the vehicle are conceptualized as a set of salient semantic features which form a hierachical order within each term. Metaphorical comprehension occurs when the reader selects a shared feature for the topic and the vehicle which accommodates the fusion of these terms in the form of a new meaning. The shared feature is viewed as highly salient for the vehicle and low salient for the topic. This perceived condition results in salience imbalance which is a precondition for metaphorical comprehension. When the terms of the metaphor are reversed, metaphor comprehension is not possible because the asymmetry between the perceived salience level of the vehicle and the topic is altered.

A total of 90 grade six students, an equal number of boys and girls, participated in the study. All the subjects scored above the fiftieth percentile on the school district's Elementary Reading Test. There were three treatment groups. The stimuli involved six metaphors developed from grade six readers, children's literature, and by the researcher. Subjects in group one paraphrased metaphors and evaluated their "goodness" on a five point scale. In group two, subjects paraphrased metaphors and selected salient attributes for the topic and the vehicle from a list. Subjects in the third group paraphrased metaphors and evaluated the perceived level of salience of the shared attribute for the vehicle and for the topic. A pilot study was used to determine suitability of the metaphors and of procedures for administration of the tasks. The responses given by subjects were compared between and within groups. A t-test, one-way analysis of variance, Pearson's correlation coefficient, and Chi-square were used as methods of statistical analysis.

## Conclusions

The major conclusions of the study are presented here in relation to the four research questions.

It was found that subjects comprehended metaphors significantly better in the ascending mode as compared to the descending mode. The "goodness" scores measured the similarity of the topic and the vehicle of the metaphors. The subjects perceived the similarity of the terms (goodness scores) significantly higher in the ascending mode as opposed to the descending (reversed) mode. Although this statement is true overall, these differences were not as large for some of the metaphors as for others. The relationship between comprehension and goodness scores was found to be significant only for one-third of the metaphors in both the ascending and the descending modes. It seems that idiosyncratic conditions in children's processing of metaphors also play an important role in the comprehension of particular metaphors. "The relative weights assigned to features may differ for different people" (Tversky, 1977, p.340).

When the subjects received a list of 12 attributes for each of the topic and the vehicle, they scored higher on comprehension than subjects who did not get additional attributes. There was a statistically significant difference in means between the groups. The impact of the availability of additional attributes on metaphor comprehension, however, varied according to children's cognitive processing as well as on individual metaphors.

The degree of relationship between metaphor comprehension scores and defining or characteristic attributes selected by subjects was also investigated. The statistical analysis failed to yield any significant relationship between comprehension scores and defining scores for the vehicle or the topic. However, there was a significant relationship between the variables for one-third of the metaphors when only correct comprehension scores were considered as the dependent variable. These findings have to be treated with caution, however, because three statistical analyses were performed on the same data. A general tendency of selecting more defining features for the vehicle than for the topic was evident among the subjects. But this tendency reached a level of significance for only a few metaphors. There were idiosyncratic differences among children in their attempts to select defining features in order to obtain metaphorical comprehension. Similarly, the degree of relationship between comprehension scores and characteristic scores was studied. It was found that there was no significant relationship between these variables although as a tendency, children selected more characteristic features for the topic and less for the vehicle. However, their selection of attributes was found again to be highly idiosyncratic.

The role of the shared attribute in the metaphor comprehension process was the focus of the fourth research question. It was found that comprhension scores were significantly higher when subjects received shared attributes as compared with a group which did not receive shared attributes. In addition, it was found that there was a significant relationship between comprehension scores and saliency scores of shared attributes for the vehicle in half of the metaphors. But there was no significant relationship between comprehension scores and saliency scores for the topic. When correct comprehension scores were considered as the dependent variable, further analysis of the data yielded a significant relationship between comprehension and saliency scores of the shared attribute for both terms in the majority of the metaphors. These findings again should be viewed with caution because a post-hoc test was performed on the same data. A descriptive analysis of results also revealed differences in the structure and extent of children's and adults' schemata.

## Implications of the Study

### Implications for the Theory

The Salience Imbalance Theory of metaphor processing, in a broader sense, is a theory of similarity. In every metaphor, two domains are compared (topic and vehicle) based on the relative similarity of their semantic features which are carriers of meaning. Those features which are shared by both terms of the metaphors serve to establish a new identity, a fusion of the terms. The perceived level of salience of these shared features is not equal in a metaphorical statement. The shared feature is viewed as more salient for the vehicle than for the topic. The Salience Imbalance Model predicts that the difference in the salience levels results in a high degree of salience imbalance which causes metaphoricity. Therefore, if the salience level of the shared feature changes, the perceived metaphoricity of the similarity statement will change also. By reversing the order of the terms of a metaphor, the salience level of the shared attribute increases for the topic and decreases for the vehicle. Therefore, it was predicted by the theory that in the reversed (descending) mode, metaphoricity and with it metaphor comprehension would decrease. To test the correctness of this prediction of the Salience Imbalance Model, the ~~focus of~~ the first research question was on the effect of the order of terms (ascending and descending modes) on children's comprehension of metaphors. It was assumed, based on the prediction of the theory, that children would achieve significantly higher comprehension scores in the ascending mode than in the descending mode. This was assumed because in the descending mode the shared attribute is low in salience for the vehicle and high in salience for the topic. It is difficult for children to view the topic and the vehicle as similar under this condition because there are no high salient features of the vehicle in the intersecting set for a reversed metaphorical statement. The results of the study supported the prediction of the Salience Imbalance Theory that the measure of salience of features is affected by the order of the topic and the vehicle in metaphors because children achieved significantly higher comprehension scores in the ascending mode than in the descending mode. However, it is important to note that there were examples of children's responses which the Salience Imbalance Theory did not explain. In certain instances, children were able to correctly interpret metaphors in both the ascending and the descending modes or in the descending mode only. During the cognitive process of obtaining meaning in the descending mode, the formerly high salient feature of the vehicle lost its salience level in the topic position, and a new highly salient attribute of the vehicle was applied to the topic. Although the Salience Imbalance Theory explains the significant majority of instances, it needs a more detailed and comprehensive theoretical mechanism (besides "attribute promotion") to account for the above processing anomalies. Consequently, an extension of the theory is recommended to include and explain the changing salience levels of particular semantic features of the metaphor.

To measure the perceived similarity of the terms of the metaphor, a consequence of the salience imbalance of semantic features, goodness scores were compared in the ascending and the descending modes. These differences were found to be statistically significant, supporting the prediction of the theory that the perceived similarity of the topic and the vehicle would be higher in the ascending mode as compared to the descending mode. This is also support for the "asymmetry hypothesis" of the theory.

Since the predictions of the Salience Imbalance Theory for salience imbalance and asymmetry were supported by the findings, it was reasonable to assume that there would be a significant degree of relationship between comprehension and goodness scores also. The limited statistical support in this regard was unanticipated. The theory explains the comprehension of metaphors from the point of view of similarity, and although the general predictions of the theory turned out to be correct, there were instances in which certain metaphors were comprehended and evaluated by the subjects differently. It seems that in certain instances metaphor comprehension occured when no high salient feature was selected (a lack of schema or difficulty in selecting it), no fusion of terms was attempted (cognitive processing difficulty), idiosyncratic processing was evident, or emotive considerations played a central role in the process of selecting common features for the topic and the vehicle. Therefore, it is suggested that the domain of the theory be extended by integrating schemata theory, and theory of cognitive psychology to explain a broader range of phenomenon. This call for the extension of the Salience Imbalance Theory is also supported by the results of the study on the role of the number of attributes (features) available to the subjects.

In metaphors, during the comprehension process, the topic and the vehicle are compared on the basis of their features. If the features are found to be matchable or similar, comprehension will take place. Therefore, the concept of similarity could be viewed as a feature matching process. When more defining features are added to the list already available to the subjects, the simiarity of the topic and the vehicle will increase. This will result in the enhancement of metaphor comprehension. This hypothesis justifies asking the second research question because if the number of defining features is increased, chances will also be higher for children to find more matchable attributes for both terms. The findings of the study support this hypothesis because a statistically significant difference was found between means of groups when subjects received additional semantic features and when they did not receive additional features. The theoretical implications of this finding are twofold. First, it underlies the importance of the schemata theory to the

Salience Imbalance Theory; and secondly, it directs attention to the nature of chilren's cognition which could lead to the formulation of a broader model of metaphor processing.

The Salience Imbalance Theory also predicts that the salience level of the intersecting features of the topic and the vehicle is more dependent on the salience value of the matching elements in the vehicle than in the topic. These salient features or defining attributes were investigated to test the prediction of the theory. It was assumed that when subjects comprehended metaphors they would select significantly more defining attributes for the vehicle because the shared attribute would be viewed as more salient for the vehicle than for the topic. The findings did not support this assumption. Generally, children selected more defining (salient) features for the vehicle and less defining features for the topic but not on a level of significance. It seems that the presence of a defining feature which is highly salient for the vehicle and less salient for the topic does not automatically accommodate metaphorical meanings. In some instances, a set of features for the terms of a metaphor containing several defining features which meet the above condition do not accommodate metaphorical comprehension. The selection of one specific defining feature seems to be highly dependent on individual preferences, extent of schemata, and on cognitive processing. Therefore, the previously suggested extension of the theory to explain the cognitive process of selecting a given feature is recommended here also.

The findings on the degree of relationship between comprehension and characteristic scores were not significant and have the same theoretical implications as findings on defining features. The selection of features again turned out to be highly idiosyncratic.

According to the prediction of the Salience Imbalance Theory, comprehension of metaphors takes place when the subjects successfully select a shared attribute which is perceived as more salient for the vehicle as opposed to the topic. The findings of this study support the prediction of the theory because a significant difference of means were found between a group which had not been given a shared attribute for each metaphor and a group which had. The role of the shared attribute, as predicted, was found to be crucial in the process of metaphor comprehension because it assisted children in their cognitive efforts to clarify the concept of the vehicle.

As a further step to test the theory, this study investigated if there was a significant relationship between comprehension scores and salience scores. Because the presence of shared attributes was found to be significant to metaphor comprehension, and because the shared attribute is predicted to be more salient for the vehicle, the above relationship was expected to be significant. The findings of this study represent only partial support for the hypothesis. However, the relationship between correct comprehension scores and salience scores was significant for the majority of metaphors. As an implication for theory, it seems that children perceive the shared attribute as more salient for the vehicle. But, in terms of processing, there was a discrepancy between children's comprehension processing of metaphors and their cognitive processing employed during the evaluation task of salience because salience appeared to mean different things to different children. As a result, it seems desirable to extend the theory into the domain of cognitive processing.

## Implications for Practice

The Salience Imbalance Theory of metaphor processing was found to be useful and applicable in providing an account of children's comprehension of metaphors. Its predictions supported by the study have practical implications for teachers.

Since semantic features play a crucial role in carrying meaning and comprehending metaphors, a systematic expansion of children's schemata in a broader sense of the language environment is paramount. This is a basic precondition to successful metaphor comprehension. In this context, the formulation of the concept of salience, and along with it the development of skills to identify and select a shared attribute which is more salient for the vehicle as opposed to the topic, is viewed as useful. At points of difficulty, providing children with an appropriate shared attribute would appear to be an effective means of increasing comprehension of metaphors being read.

Also, more thorough understanding of individual children's cognition needs to be emphasized because children use a broad assortment of cognitive strategies in a highly idiosyncratic manner.

A familiarity with their cognitive processing could help teachers aid children in locating areas in their processing which require special assistance.

## Limitations of the Study

The complexity of the educational environment in itself is a significant source of confounding variables which does not allow the optimal experimental conditions demanded by theoretical considerations. This study is no exception in this sense. Based on this observation, therefore, the following limitations of this study are apparent:

1. The subjects' knowledge and background experience was different on an individual and idiosyncratic basis for which full control could not be established. However, this factor was partially controlled through random assignment of children to treatment groups.

2. Similarly, children are different in their cognitive processing skills, another limiting factor in metaphor comprehension. Again, random assignment was used in an attempt to control the effect of differences on this variable across treatment groups.

3. It is acknowledged that different kinds of metaphors, for instance scientific metaphors, may produce different kinds of responses. From the grammatical point of view, all the metaphors presented to the subjects were noun metaphors. But it cannot be

denied that verb metaphors, genitive metaphors, relational metaphors etc. might have produced different responses also.

4. The subjects were exposed to a set of highly constrained metaphors which do not reflect the range of metaphors which grade six children encounter in their regular conversations and reading materials. Hence, the results of the study cannot be generalized to other metaphors.

5. Another limitation of this study was the presentation of the stimuli to the subjects without any natural context. The nature of children's responses in the paraphrasing task could have varied significantly if the metaphors were presented in context. The "contextual predictability is an important variable in metaphor comprehension" (Vosniadou, 1984, p.1603).

6. The metaphors (stimuli) in this study were presented to the children in list form, a fact which increased the probability of recognizing them more readily as nonliteral. Under normal reading conditions this probability would be lower.

7. Because time, fatigue, and subjects' interest were taken into consideration, only six metaphors were used to elicit responses.

8. Because the metaphors involved in this study were selected by adults, they may not have reflected the schemata of children. In addition, the adult schemata was used in scoring childrens' responses to metaphors with only the "standard" metaphor interpretation being scored as most acceptable.

9. The tasks developed for this study are highly structured and

the results indicate what children can do when this structure is provided, but not what they spontaneously do when they meet metaphors as they are reading.

10. The correlation method, used to relate variables to the dependant variable of metaphor comprehension and to find significant relationships between them, could not be used to establish a cause-and-effect relationship.

11. It is also a limitation of empirical studies that this method breaks down the complex phenomenon of metaphor comprehension into simpler components.

## Recommendations for Further Research

As a result of the findings, it is recognized that metaphor comprehension is a very complex phenomenon, and needs to be studied by a broad range of disciplines. Some related questions which could provide direction for further research are provided below.

1. How does the availability of additional semantic features for subjects affect the comprehension of individual metaphors?

2. How does the semantic structure of the topic and the vehicle affect the comprehension process?

3. What is the relationship between the subjects' schemata structure for metaphors and their cognitive processing strategies used to comprehend metaphors? Are these strategies dependent on their schemata or word knowledge?

4. What are the variables which affect the comprehension of

individual metaphors?

5. What is the nature of the cognitive processes employed in the selecting of defining features and in the selection of shared attributes among the defining features which accommodates metaphorical comprehension?

6. How do subjects select shared attributes from a list of attributes which is either given to them or available to them in their long range memory? What is the role of salience in this process?

7. What is the nature of children's metacognitive awareness of metaphors and how does this affect their comprehension of metaphors?

Both experimental and ethnographic studies are recommended to develop further understanding of children's comprehension of metaphors.

# REFERENCES

Aristotle. (1960). The poetics. With an English translation by W. Hamilton Fyfe. Cambridge, Mass.

Aristotle (1924). Rhetoric , trans. W. Rhys Roberts, Vol.XI of Works, ed. W. D. Ross, Oxford.

Baldwin, R.S., Luce ,& Readence, J.E. (1982). The impact of subschemata on metaphorical processing. Reading Research Quarterly, XVII, 528-544.

Baldwin, R.S., Readence, J.E., & Miller, G.M. (1984). Context and its effects on metaphorical interpretation. Paper presented at AERA, New Orleans, La.

Barfield, O. (1928). Poetic diction . London, 1928. "Poetic Diction and Legal Fiction", in Essays Presented to Charles Williams, London.

Barsalou, L. W. (1982). Context independent and context-dependent information in concepts. Memory and Cognition, 10, 82-93.

Bencze, L. (1983). A metafora meghatarozasa es helye az arisztoteleszi fogalomrendszerben. Filologiai Kozlony. 2, 274.

Black, M. (1962). Models and metaphors. Ithaca, N.Y.: Cornell University Press.

Bloomfield, L. (1933). Language. New York: Holt.

Borg, W.R. & Gall, M.D. (1983). Educational research. An introduction. New York & London: Longmore Inc.

Breal, M. (1964). Semantics. New York: Dover.

Cerbin, W. (1982). A study of young children's comprehension of metaphorical language. Reports-Research/Technical (143). University of Wisconsin-La Crosse, Wisconsin.

Chomsky, N. (1965). Aspects of the theory of syntax. Cambridge, Mass: M.I.T. Press.

Cicero. (1942). De Oratore . Trans. E.W.Sutton and H. Rackham, 2 vols. Loeb Classical Library, London.

Cohen, T. (1978). Metaphor and the cultivation of intimicy. In S.

Sacks (Ed.), On Metaphor. Chicago: The University of Chicago Press.

Connor, K., & Kogan, N. (1980). Topic-vehicle relations in metaphor: The issue of asymmetry. In R.P. Honeck & R.R. Hoffman (Eds.). Cognition and figurative language. Hillside, New Jersey: Lawrence Erlbaum Associates.

Cross, M.E., Hullard, J. (1975). Starting points in reading. Second book. Canada: Ginn and Company Educational Publishers.

Davidson, D. (1978). What metaphors mean. In S.Sacks (Ed.), On metaphor. Chicago: The University of Chicago Press.

Empson, W. (1930, 1953). Seven types of ambiguity . London.

Fagan, W.T.(1983). The learning and teaching of reading . Unpublished textbook, University of Alberta.

Gentner, D. (1984). Metaphor as structure-mapping: What develops. Center for the Study of Reading. University of Illinois at Urbana-Champaign. Technical Report No. 315.

Harris, R.J. (1976). Comprehension of metaphors: A test of the two-stage processing model. Bulletin of the Psychonomic Society , 8, 312-314.

Harris, R.J. (1979). Memory for metaphors. Journal of Psycholinguistic Research, 8, 61-71.

Harris, R.J., Lakey, M.A. & Marsalek, F. (1980). Metaphors and images: ratings reporting, and remembering. In R. P. Honcek & R.R. Hoffman (Eds.), Cognition and figurative lanaguage. Hillside, New Jersey: Lawrence Erlbaum Associates.

Harwood, D., & Verbrugge, R.R. (1977). Metaphor and the asymmetry of similarity. In W. Kintsch, Recent psycholinguistic research with metaphors . Symposium presented at the meeting of the American Psychological Association, San Francisco.

Hawkes, T. (1972). Metaphor. London: Methuen & Co. Ltd.

Hoffman, R.R. & Honeck, R.P. (1980). A Peacock looks at its legs: Cognitive science and figurative language. In R.P. Honeck & R.R. Hoffman (Eds), Cognition and figurative language. Hillsdale, New Jersey; Lawrence Erlbaum Associates.

Honeck, R.P. & R.R. Hoffman. (1980). *Cognition and figurative language.* Hillside, New Jersey: Lawrence Earlbaum Associates.

Honeck, R.P., Voegtle, K., & Sowry, B. (1978). Proverbial understanding in pictorial context. *Child Development,* 49, 327-331.

Honeck, R.P., Voegtle, K., Dorfmueller, M.A., & Hoffman, R.R. (1980). Proverbs, meaning, and group structure. In E.P. Honeck, & R.R. Hoffman (Eds.), *Cognition and figurative language* . Hillsdale, New Jersey. Lawrence Earlbaum Associates.

Johnson, M. (1980). A Philosophical perspective on the problems of metaphor. In R.P. Honeck & R.R. Hoffmam (Eds), *Cognition and Figurative Language* . Hillsdale, New Jersey. Lawrence Erlbaum Associates.

Katz, N.A. (1982). Metaphoric relationships: The role of feature saliency. *Journal of Psycholinguistic Research,* 11, 282-295.

Kintsch, W. (1972). Notes on the semantic structure of memory, In E. Tulving & W. Donaldson (Eds.), *Organization of Memory.* New York: Academic Press.

Kintsch, W. (1974). *The representation of meaning in memory.* Hillsdale, N. J.: Lawrence Erlbaum Associates.

Leech, G.N. (1969). *A linguistic guide to english poetry.* London: Longmans.

Levin, S. (1977). *The semantics of metaphor.* Baltimore: Johns Hopkins University Press.

Loewenberg, I. (1972). Identifying metaphors. *Foundations of Language,* 12, 315-338.

Longinus. (1965). On the sublime, in *Classical Literary Criticism* , trans. T.S. Dorsch, Penguin Books.

Mack, D. (1975). Metaphoring as speech act: Some happiness conditions for implicit similes and metaphors. *Poetics,* 4, 221-256.

Malgady, R.G., & Johnson, M.G. (1976). Modifiers in metaphors: Effects of constituent phrase similarity on the interpretation of figurative sentences. *Journal of Psycholinguistic bResearch,* 5, 43-52.

figurative sentences. Journal of Psycholinguistic Research, 5, 43-52.

Malgady, R. G., & Johnson, M. G. (1980). Measurement of figurative language: Semantic feature models of comprehension and appreciation.In R.P. Honeck & R.R Hoffman (Eds), Cognition and figurative language. Hillside, New Jersey: Lawrence Erlbaum Associates.

Martin, B. (1967). Sounds of a distant drum. New York, Toronto, London: Holt, Rinehart and Winston, Inc.

Matthews, R.J. (1971). Concerning a linguistic theory of metaphor. Foundations of Language, 7, 413-425.

Miller, G.A. (1979). Images and models, similes and metaphors. In A. Ortony (Ed.), Metaphor and thought . Cambridge, England: Cambridge Universit Press.

Nowottny, W. (1972). The language poets use, London: The Athlone Press.

Ortony, A. (1978). Metaphor: Thoretical and empirical research. Psychological Bulletin, 5, 919-941.

Ortony, A. (1975). Why metaphors are necessary and not just nice. Educational Theory, 25, 45-53.

Ortony, A. (1979). Beyond literal similarity. Psychological Review, 86, 161-180.

Ortony, A. (1979 (b). The role of similarity in similes and metaphors. In A.Ortony (Ed.), Metaphor and thought. Cambridge: Cambridge University Press.

Ortony, A. (1980). Some psycholinguistic aspects of metaphor. In R.P. Honeck & R. R. Hoffman (Eds.), Cognition and Figurative Language. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Ortony, A., Vandruska, M.A., Foss, M.A., & Jones, L.E. (1985). Salience, similes, and the asymmetry of similarity. University of Illinois at Urbana Champaign. Technical Report No. 332.

Osgood, C.E. (1980). The cognitive dynamics of synesthesia and metaphor In R.P. Honeck & R.R. Hoffman (Eds.), Cognition and Figurative Language . Hillsdale, New Jersey: Lawrence Erlbaum Associates Publishers.

Perrine, L. (1971). Four forms of metaphor. College English, 33, 125-138.

Plato. (1968). Republic. Translated by A. Bloom. New York: Basic Books. Quintilian. (1920-22). Instituta Oratoria, trans. H.E. Butler, 4 vols., Loeb Classical Library, London.

Pollio, H.R., Barlow, J. M., Fine, H.J. & Pollio, M.R. (1977). Psychology and the poetics of growth . Hillsdale, N.J.: Lawrence Erlbaum Associates.

Readence, J.E., Baldwin, R.S., Martin, M.A., & O'Brien, D.G. (1984). Metaphorical interpretation: An investigation of the salience imbalance hypothesis. Journal of Educational Psychology, 76, 659-667.

Richards, I.A. (1936). The philosophy of rhetoric . New York: Oxford University Press.

Ricoeur, P. (1978). The metaphorical process as cognition, imagination, and feeling. In S. Sacks (Ed.), On metaphor . Chicago: The University of Chicago Press.

Riechmann, P.F., & Coste, E.L. (1980). Mental imagery and the comprehensio of figurative language: Is there a relationship? In R.P. Honeck & R.R. Hoffman (Eds.), Cognition and Figurative Language. Hillside, New Jersey: Lawrence Erlbaum Associates.

Sacks, S. (1979). On metaphor. Chicago: The University of Chicago Press.

Shibles, W. A. (1971). Metaphor:An annotated bibliography and history . Whitewater, Wisconsin: The Language Press.

Smith, E.E., Shoben, E.J. & Rips, L.J. (1974). Structure and process in semantic memory: A feature model for semantic decisions. Psychological Review, 81, 214-241.

Sternberg, R.J. (1977). Intelligence, information processing and analogical reasoning. Hillsdale, N. J.:Lawrence Erlbaum Associates.

Tanhauser, S.L. (1978). Levels of interpretation: A study of metaphor-iteral differences. Paper presented at the Midwestern Psychological Association, Chicago.

Tversky, A. (1977). Features of similarity. Psychological Review, 84, 327-352.

Tversky, A. (1972). A theory of choice. Psychological Review, 79, 281-299.

Tourangeau, R., & Sternberg, R.J. (1978). Aptness in metaphor (ONR Tech. Rep.No. 13). New Haven: Department of Psychology, Yale University.

Vosniadou, S., Ortony, A., Reynolds, Ralph, E., & Wilson, P.T. (1984) Sources of difficulty in the young child's understanding of metaphorical language. Child Development, 55, 1588-1606.

Verbrugge, R.R. (1980). Transformations in knowing: A realist view of metaphor. In R.P. Honeck & R.R. Hoffman (Eds.), Cognition and Figurative Language . Hillside, N. J.: Lawrence Erlbaum Associates.

Verbrugge. R. (1977). Resemblances in language and perception. In R.E. Shaw &J.D. Bransford (Eds.), Perceiving, acting, and knowing: Toward an ecological psychology. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Verbrugge. R., & McCarrell, N. (1977). Metaphoric comprehension: Studies in reminding and resembling. Cognitive Psychology, 9, 494-533.

Wheelwright, P. (1962). Metaphor and reality. Bloomington, Indiana: Indiana University Press.

# APPENDIX A

## Edmonton Public School Board Elementary Reading Test Scores

Group 1

| ID | Sex | School | Reading Scores | |
|---|---|---|---|---|
| | | | Decoding | Comprehension |
| 01 | M | 1 | 79 | 83 |
| 02 | M | 1 | 79 | 63 |
| 03 | M | 1 | 57 | 83 |
| 04 | F | 1 | 89 | 99 |
| 05 | M | 1 | 63 | 56 |
| 06 | M | 1 | 57 | 66 |
| 07 | M | 1 | 94 | 99 |
| 08 | M | 1 | 68 | 78 |
| 09 | M | 4 | 96 | 96 |
| 10 | M | 2 | 81 | 97 |
| 11 | M | 2 | 56 | 53 |
| 12 | M | 2 | 81 | 89 |
| 13 | F | 2 | 94 | 94 |
| 14 | F | 2 | 83 | 79 |
| 15 | F | 2 | 94 | 97 |
| 16 | F | 2 | 75 | 68 |
| 17 | F | 2 | 96 | 84 |
| 18 | M | 2 | 69 | 68 |
| 19 | F | 2 | 86 | 94 |
| 20 | F | 3 | 79 | 51 |
| 21 | F | 3 | 94 | 78 |
| 22 | F | 3 | 97 | 91 |
| 23 | F | 3 | 94 | 98 |
| 24 | F | 3 | 63 | 66 |
| 25 | M | 3 | 63 | 63 |
| 26 | F | 3 | 89 | 99 |
| 27 | M | 3 | 53 | 86 |
| 28 | M | 4 | 74 | 75 |
| 29 | M | 4 | 84 | 78 |
| 30 | F | 4 | 89 | 78 |
| | | Mean: | 79.2 | 80.7 |

## Edmonton Public School Board Elementary Reading Test Scores

Group 2

| ID | Sex | School | Reading Scores | |
|---|---|---|---|---|
| | | | Decoding | Comprehension |
| 31 | M | 1 | 79 | 94 |
| 32 | F | 1 | 97 | 98 |
| 33 | F | 1 | 74 | 75 |
| 34 | F | 1 | 97 | 96 |
| 35 | F | 1 | 57 | 72 |
| 36 | F | 1 | 89 | 83 |
| 37 | M | 1 | 97 | 94 |
| 38 | F | 1 | 94 | 86 |
| 39 | M | 2 | 83 | 74 |
| 40 | M | 2 | 99 | 97 |
| 41 | M | 2 | 75 | 63 |
| 42 | F | 2 | 96 | 89 |
| 43 | M | 2 | 69 | 53 |
| 44 | M | 2 | 81 | 79 |
| 45 | M | 2 | 89 | 68 |
| 46 | M | 2 | 94 | 97 |
| 47 | M | 3 | 94 | 86 |
| 48 | M | 3 | 94 | 86 |
| 49 | F | 3 | 84 | 83 |
| 50 | M | 3 | 74 | 56 |
| 51 | F | 3 | 94 | 99 |
| 52 | M | 3 | 97 | 89 |
| 53 | F | 3 | 97 | 86 |
| 54 | F | 3 | 89 | 96 |
| 55 | M | 3 | 68 | 63 |
| 56 | F | 3 | 79 | 58 |
| 57 | M | 4 | 63 | 83 |
| 58 | F | 4 | 84 | 94 |
| 59 | M | 4 | 84 | 91 |
| 60 | F | 4 | 84 | 91 |
| | | Mean: | 85.6 | 81.9 |

## Edmonton Public School Board Elementary Reading Test Scores

Group 3

| ID | Sex | School | Reading Scores | |
|---|---|---|---|---|
| | | | Decoding | Comprehension |
| 61 | F | 1 | 94 | 75 |
| 62 | M | 1 | 85 | 65 |
| 63 | F | 1 | 63 | 83 |
| 64 | M | 1 | 97 | 98 |
| 65 | F | 1 | 89 | 99 |
| 66 | F | 1 | 94 | 96 |
| 67 | M | 1 | 57 | 51 |
| 68 | M | 1 | 94 | 78 |
| 69 | M | 1 | 68 | 89 |
| 70 | F | 2 | 81 | 84 |
| 71 | F | 2 | 98 | 89 |
| 72 | F | 2 | 94 | 97 |
| 73 | F | 2 | 86 | 84 |
| 74 | F | 2 | 61 | 84 |
| 75 | M | 2 | 99 | 94 |
| 76 | F | 2 | 96 | 97 |
| 77 | M | 2 | 89 | 68 |
| 78 | F | 3 | 97 | 96 |
| 79 | M | 3 | 79 | 72 |
| 80 | M | 3 | 84 | 58 |
| 81 | M | 3 | 89 | 81 |
| 82 | F | 3 | 94 | 86 |
| 83 | M | 3 | 97 | 91 |
| 84 | F | 3 | 74 | 59 |
| 85 | F | 3 | 84 | 96 |
| 86 | F | 3 | 84 | 75 |
| 87 | F | 3 | 94 | 81 |
| 88 | F | 4 | 84 | 78 |
| 89 | M | 4 | 94 | 63 |
| 90 | M | 4 | 74 | 63 |
| | | Mean: | 85.8 | 81.0 |

# APPENDIX B

## Instruments for Groups 1, 2, and 3

### Group 1

Read the following sentences and write down on the blank lines what the meanings of these sentences are. Also tell how meaningful or "good" these sentences are by rating them from 5 to 1 on the scale given. For instance, circle 5 if you think that the meaning of the sentence is "clear", or makes lots of sense to you. But circle 4,3,2, or 1 if you think the meaning of the sentence is only "good", "average", "fair", or "poor".

1. Recess is a whirlpool.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

2. The whirlpool is recess.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

3. The weather is a roller coaster.

______________________________________________

______________________________________________

______________________________________________

______________________________________________

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

4. The roller coaster is a weather.

______________________________________________

______________________________________________

______________________________________________

______________________________________________

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

5. The sailboat is a ballerina.

______________________________________________

______________________________________________

______________________________________________

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

6. The ballerina is a sailboat.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

7. The veil is a smudge.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

8. The smudge is a veil.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

9. The hose is a boa-constrictor.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

10. The boa-constrictor is a hose.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| poor | fair | average | good | very good |

11. The salad is a notebook.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| poor | fair | average | good | very good |

12. The notebook is a salad.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| poor | fair | average | good | very good |

Group 2

1. Study the following pair of words along with the lists that belong to each:

| recess | whirlpool |
|---|---|
| -playing and shouting | -whirling turbulence |
| -games | -violent currents |
| -on school yard | -circling motion |

- -free time
- -bells ring
- -being agitated
- -noise
- -disorderly
- -unrestrained
- -running
- -violent movements
- -wild and turbulent

- -moving fast
- -rumbling noise
- -engulfing
- -dangerous
- -powerful
- -hard to escape
- -depth
- -hole in the center
- -enticing to watch

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

Recess is a whirlpool

____________________________________________

____________________________________________

____________________________________________

____________________________________________

3. Select six words from the first ("recess") group which are the most important, essential, significant to the meaning of recess.

recess : ______________________________________

______________________________________

Select six words from the second ("whirlpool") group which are the most important, essential, significant to the meaning of whirlpool.

whirlpool : ____________________________________

________________________________________

________________________________________

4. Order your selected words about "recess" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

recess

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

Order your selected words about "whirlpool" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

whirlpool

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

1. Study the following pair of words along with the lists that belong to each:

| weather | roller coaster |
|---|---|
| -sunny and warm | -ups and down |
| -clouds | -constant changes |
| -strong wind | -drops, plunges |
| -rain, fog | -unexpectedness |
| -stormy | -unpredictable |
| -snowing, cold | -can't be controlled |
| -varying | -small cars |
| -can't be controlled | -painted brightly |
| -lacks consistency | -made of metal |
| -difficult to predict | -noisy |
| -full of surprises | -turns sharply |
| -sudden changes | -accident |

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

The weather is a roller coaster

______________________________________________

______________________________________________

______________________________________________

______________________________________________

3. Select six words from the first ("weather") group which are the most important, essential, significant to the meaning of weather.

**weather** : ______________________________

______________________________

Select six words from the second ("roller coaster") group which are the most important, essential, or significant to the meaning of roller coaster.

**roller coaster** : ______________________________

______________________________

______________________________

4. Order your selected words about "weather" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

**weather**

1. ____________
2. ____________
3. ____________
4. ____________
5. ____________
6. ____________

Order your selected words about "roller coater" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

roller coaster

1.____________________

2.____________________

3.____________________

4.____________________

5.____________________

6.____________________

1. Study the following pair of words along with the lists that belong to each:

| sailboat | ballerina |
|---|---|
| -tall | -graceful movements |
| -sweeping sails | -slender |
| -whiteness | -gliding |
| -driven by wind | -attractive |
| -easy to tip over | -elegance |
| -sports and race | -delicate, fine |
| -beautiful to watch | -dancing |
| -elegant | -fine dress |
| -delicate structure | -sophisticated |
| -gliding on water | -harmony |

-slim
-gracefulness

-on stage
-entertainment

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

The sailboat is a ballerina

______________________________

______________________________

______________________________

______________________________

3. Select six words from the first ("sailboat") group which are the most important, essential, significant to the meaning of sailboat.

sailboat : ______________________________

______________________________

Select six words from the second ("ballerina") group which are the most important, essential, significant to the meaning of ballerina.

ballerina : ______________________________

______________________________

______________________________

4. Order your selected words about "sailboat" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

sailboat

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

Order your selected words about "balerina" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

ballerina

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

1. Study the following pair of words along with the lists that belong to each:

| smudge | veil |
|---|---|
| -dirty spot | -covers |
| -smear | -irregular shape |
| -stain | -small in size |

- -greasy
- -messy
- -unpleasant
- -dark in color
- -hard to clean
- -sparsely distributed
- -shapeless
- -on the surface
- -covers a small area

- -removable
- -blurs view
- -thin
- -piece of cloth
- -like gauze
- -worn by women
- -conceals the face
- -hangs loose
- -looks pretty

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

The smudge is a veil

______________________________________________

______________________________________________

______________________________________________

______________________________________________

3. Select six words from the first ("smudge") group which are the most important, essential, significant to the meaning of smudge.

smudge : ________________________________________

________________________________________

Select six words from the second ("veil") group which are the most important, essential, or significant to the meaning of veil.

veil : ________________________________________

4. Order your selected words about "smudge" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

**smudge**

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

Order your selected words about "veil" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

**veil**

1.____________________
2.____________________
3.____________________
4.____________________
5.____________________
6.____________________

1. Study the following pair of words along with the lists that belong to each:

| hose | boa-constrictor |
|---|---|
| -like a pipe | -long shape |
| -nozzle is attached | -slithering movement |
| -spurts out water | -winding through |
| -green color | -coils up |
| -made of plastic | -on the ground |
| -rolled up when stored | -blends into the environment |
| -easy to bend | -large snake |
| -hangs in coils | -brown color |
| -weaves through grass | -dangerous |
| -narrow in diameter | -silently moves |
| -like a tube | -crushes its prey |
| -very long | -found in tropical forests |

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

The hose is a boa-constrictor

______________________________________________

______________________________________________

______________________________________________

________________________________________

3. Select six words from the first ("hose") group which are the most important, essential, significant to the meaning of hose.

hose : ____________________________________

____________________________________

Select six words from the second ("boa-constrictor") group which are the most important, essential, significant to the meaning of boa-constrictor.

boa-constrictor :______________________________

____________________________________

____________________________________

4. Order your selected words about "hose" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

hose

1.________________

2.________________

3.________________

4.________________

5.________________

6.________________

Order your selected words about "boa-constrictor" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

boa-constrictor

1.____________________

2.____________________

3.____________________

4.____________________

5.____________________

6.____________________

1. Study the following pair of words along with the lists that belong to each:

| notebook | salad |
|---|---|
| -scrapbook | -torn pieces |
| -blank pages | -messy, untidy |
| -to jot down into | -shredded ingredients |
| -personal | -varied components |
| -has various purposes | -loosely arranged |
| -becomes worn with use | -mixed |
| -mixed items | -raw vegetable |
| -lacks organization | -dressing on top |
| -haphazard | -spicy |
| -tattered condition | -not filling |
| -untidy | -eaten before main meal |

-torn leaves -healthy food

2. Write down using your own words what the meaning of the following sentence is. Don't forget, spelling is not important now!

The notebook is a salad

____________________________________________

____________________________________________

____________________________________________

____________________________________________

3. Select six words from the first ("notebook") group which are the most important, essential, significant to the meaning of notebook.

notebook : ________________________________________

____________________________________________

Select six words from the second ("salad") group which are the most important, essential, or significant to the meaning of veil.

salad :____________________________________________

____________________________________________

____________________________________________

4. Order your selected words about "notebook" in terms of importance or significance. List the most important, essential, or significant word first as no.1, the second most important word as no.2 etc.

notebook

1.____________________

2.____________________

3.____________________

4.____________________

5.____________________

6.____________________

Order your selected words about "salad" in terms of importance or significance. List the most important, essential, or signififcant word first as no.1, the second most important word as no.2 etc.

salad

1.____________________

2.____________________

3.____________________

4.____________________

5.____________________

6.____________________

Group 3

1. Read the following sentences and write down on the blank lines provided what the meanings of these sentences are? A "helping word" in brackets under each sentence might further assist you.

a. Recess is a whirlpool.

(turbulent)

____________________________________________________________

b. The weather is a roller coaster.

(swift changes)

c. The sailboat is a ballerina.

(gracefulness)

d. The smudge is a veil.

(covering lightly)

e. The hose is a boa-constrictor.

(long and winding)

f. The notebook is a salad.

(untidy condition)

2. Please read the following sentences with the "helping word" and answer the questions by circling one number on the scale.

1. Recess is a whirlpool.

(turbulent)

a. How important or essential is the meaning of "turbulent" to the meaning of recess ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

b. How important or essential is the meaning of "turbulent" to the meaning of whirlpool ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

2. The weather is a roller coaster.

(swift changes)

a. How important or essential is the meaning of "swift changes" to the meaning of weather ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| not at all | little | moderately | important | very important |

b. How important or essential is the meaning of "swift changes" to the meaning of roller coaster ?

3. The sailboat is a ballerina.

(gracefulness)

a. How important or essential is the meaning of "gracefulness" to the meaning of sailboat ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| not at all | little | moderately | important | very important |

b. How important or essential is the meaning of "gracefulness" to the meaning of ballerina ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| not at all | little | moderately | important | very important |

4. The smudge is a veil.

(covering lightly)

a. How important or essential is the meaning of "covering lightly" to the meaning of smudge ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

b. How important or essential is the meaning of "covering lightly" to the meaning of veil ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

5. The hose is a boa-constrictor.

(long and winding)

a. How important or essential is the meaning of "long and winding" to the meaning of hose ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

b. How important or essential is the meaning of "long and winding" to the meaning of boa-constrictor ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

6. The notebook is a salad.

(untidy condition)

a. How important or essential is the meaning of "untidy condition" to the meaning of notebook ?

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

not at all little moderately important very important

b. How important or essential is the meaning of "untidy condition" to the meaning of salad ?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

not at all little moderately important very important

# APPENDIX C

## Data collection procedures

Before the collection of data, the following general instructions will be communicated orally to the subjects along with the presentation of one practice item for each group:

**Treatment Group 1:**

a. You will receive a booklet with six pairs of sentences. These sentences are somewhat "different" from those used "all the time" by people.

b. Please write down on the blank lines given what you think the meanings of these sentences are. Spelling is not important now!

c. After each sentence, you will find a "scale" (show on board) numbered from 5 to 1. If you find that the sentence "makes lots of sense", it "sounds good", circle the "5" (very good) as your response. But the sentences you will receive are different and the meaning of some of them may not be very clear to you. Their meanings will not make as much sense than the meanings of other sentences. Therefore, you might say that their meanings are only "good", "average", "fair", or "poor". Please circle the number which best corresponds to your feelings about the meaning of the sentence.

d. Please repeat this procedure for all the sentences given to you. You have five minutes to respond to each sentence.

e. There are no "right" or "wrong" answers to these sentences.

Therefore, you can write down "freely" what comes to your mind about them. Do your very best.

f. Your responses will not have any affect on your school marks. This is not a test!

Treatment Group 2:

a. You will receive a booklet containing six pages. On each page, there will be two words on the top. Under these main words, you will find twelve additional words or groups of words which tell more about the main words. Please, read and study the meanings of these words.

b. When you finish this task, you will find a sentence which is somewhat "different" from those used "all the time" by people. Please, write down on the blank lines given what you think the meaning of this sentence is. Spelling is not important now!

c. Select six words from each of the above lists which are the "most important" about the main words. Write them down.

d. Order your six (selected) words in terms of "importance" about the main words. The most important will be listed as no.1, the second most important as no.2, and so on until all six words are ordered.

e. Please repeat this procedure for all the pages in your booklet.

f. There are no "right" or "wrong" answers to these sentences or the selection and ordering of words. Therefore, you can write down "freely" what comes to your mind about them. Do your very best.

g. Your responses will not have any affect on your school marks. This is not a test.

Treatment Group 3:

a.Your task is divided into two steps. In the first, you will receive six sentences. These sentences are somewhat "different" from those used generally "all the time" by people. To assist you in understanding these sentences better, you will find a "helping" word under each sentence which tells more about it.

b. Please write down on the blank lines given what you think the meanings of these sentences are. Spelling is not important now!

c. In the second step of your task, you will receive a booklet with three sheets containing the same sentences and their "helping words". Two important words in each sentence will be underlined at this time. Each sentence is accompanied by two questions and scales which you are requested to respond to. The scales (show on board) are numbered from 5 to 1.

d. Please indicate how important or essential the "helping word" is to the meaning of the first underlined word by choosing and circling one number on the scale. If you think that the meaning of the helping word is very important or essential to the meaning of the first word underlined in the sentence, then circle the "5". But it might seem to you that the meaning of the helping word is only "important", "moderately important", a "little" important, or "not important at all" to the meaning of the underlined words. Please circle the number which best corresponds to your feelings about the importance of the "helping word".

e. Repeat the same procedure for the second question and scale also. Be careful, because in this question you are requested to respond to the second underlined word of the sentence!

f. Please repeat this procedure for all the sentences given to you on the sheets.

g. There are no "right" or "wrong" answers to these sentences or questions. Therefore, you can write down "freely" what domes to your mind about them. Do your best.

h. Your responses won't be "marked", consequently, they will not have any affect on your school marks. This is not a test!

# APPENDIX D

University of Alberta
Edmonton
Canada T6G 2G5

Department of Elementary Education
Faculty of Education
537 Education Building South, Telephone (403) 432-4273

Dear Parents:

This letter is intended to obtain your permission in allowing your child to voluntarily participate in a research project in reading.

As a Language Arts teacher and school principal, I found that children in all grade levels have difficulties in reading figurative sentences. This observation led me to a doctoral study to investigate how children's learning can be improved in this important area of the school curriculum.

In this project, children will be presented with six short sentences and asked to write down what they think about these sentences as well as a list of words. It will take less than an hour to complete their responses. Students will be free to withdraw from the project at any time if they would feel uncomfortable with the task. Their responses will not affect their school marks in any direct or indirect way. All participants are assured that their achievement records and the data collected will be handled confidentially and their rights to anonymity fully respected.

I sincerely hope that you will lend your support to my endeavor since our common aim is to further enhance children's learning. For your convenience, a "Consent Form" is enclosed along with this letter. Please sign and return this form to your school to support this project. Your interest and assistance is greatly appreciated.

Sincerely yours,

Z. Mate, Ph.D. Candidate
Department of Elementary Education
University of Alberta
Phone: 437-7108 (residence)

University of Alberta
Edmonton
Canada T6G 2G5

Department of Elementary Education
Faculty of Education
537 Education Building South, Telephone (403) 432-4273

## Consent Form

Student's name: ______________________________

I hereby give permission for my son/daughter to take part in a research project concerning an investigation of children's understanding of figurative language in reading.

I understand that:

a) The research is based on voluntary participation;

b) The obtained responses have no effect on school marks;

c) The data and records are handled confidentially;

d) The research does not constitute any physical or psychological harm to my child and he/she is free to withdraw at any time from the project without any consequences.

________________ Date

________________ Signature

Please return this form to the school by October 29, 1986.